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AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS

VOLUME XIII DECEMBER 1, 1924 NUMBER 20

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VOLUME XIII NEW YORK, DECEMBER 1, 1924 NUMBER 20

The Mercerization of Yarn

Practical Mercerizing Is Largely Mechanical and Depends on Certain Typical Operations—Examples of Skein and Warp Machinery—Precautions and Faults

By CHARLES F. GOLDTHWAIT

THE mercerization of yarn is a large industry, but yarn is mercerized for so many purposes and in so many places that it is difficult to get definite figures that reflect its importance. Mercerized yarn forms the main product of some very large plants; the process is an incidental manufacturing operation in others, as in the making of cotton thread; while commission mercerizing is another large branch of the textile industry. A recent textile directory gives a list of sixty-three commission yarn mercerizers, many of whom manufacture and sell mercerized yarns, and from this we can get a little idea of the extent and ramifications of this branch of processing.

While mercerization was discovered by a chemist, the advances in the art have been very largely mechanical, and a discussion of yarn mercerizing resolves itself at once into descriptions of machinery. While many machines have been devised for carrying out the process, there are but two or three general types in wide practical use and they involve the same principles as the very earliest contrivances.

Briefly stated, the principle of mercerizing any cotton cotton yarn, is first to get it thoroughly wet out; then to take out the slack or put in a little actual stretch; to immerse and thoroughly impregnate with caustic; to rinse the caustic out while still under tension; and finally to neutralize, wash and finish.

Whether mercerizing is being done on skeins or warps, the same operations must be performed, although carried out in somewhat different ways.

The designing of suitable machinery is attended by several requirements that must be met, and on which the main features of the apparatus have to depend. In whatever way the yarn is stretched or held tight, it must be maintained in that state through a caustic bath and through a washing, and the wash water, handled on the same machine, must be kept from getting into the caustic and diluting it below mercerizing strength. The machine must be strong enough to withstand the enormous strains that result from the contracting tendency of yarns that are wet with caustic.

About the simplest skein mercerizing device—that is at all practical—would be two arms or poles supported by a suitable frame and arranged to spread by the aid of a worm. If, however, the yarn was put on this machine, dipped in the caustic and then washed off by dipping or spraying, it would not be a satisfactory job of mercerizing. Where the yarn rested on the arms of the machine, it would not have had the proper stretch, proper impregnation, or sufficient rinsing. The result would be incompletely mercerized bars across the skeins, so there is one more motion required to complete the machine—a slow rotation of the arms or poles that hold the yarn—so that all parts of it will get perfectly uniform treatment.

These several mechanical movements are combined, for example, in the Smith Drum skein mercerizing machine. (Fig. 1.) In using the Smith Drum machine, which we believe is the most common skein mercerizing equipment in this country, many of the details are practically the same as with any other skein machine, but unless otherwise stated the present notes refer to this American make.

Mercerizing Skeins

The yarn to be mercerized is wet out, preferably by a light kier boil, and then whizzed just before using. This insures thorough and even penetration by the caustic. The skeins are then beaten out a little by hand and spread on the poles of the machine, uniformly and as thinly as is consistent with reasonable production.

The yarn is then stretched by heavy worms moving the poles apart. A simple test for proper stretch is suggested by the manufacturers of the machine. If the sides of the skeins are pressed toward each other by grasping between the thumb and fingers at a point half-way between the poles, and come together about half an inch on each side when moderately squeezed, the tension is right for most yarns. The writer has found that a little

less tension may be best for fine single yarns, or for heavy soft yarns that may actually stretch until they look like finer counts.

At the proper stretch, the cage of yarn is lowered into the caustic with the poles revolving. An average caustic strength is 54 deg. to 56 deg. Tw., and the time of immersion three and a half to four minutes.

At the end of this time the yarn is raised, run on the rollers for a couple of minutes or until most of the loose caustic liquor is wrung out, then the pans are thrown into place and the wash water turned on. There is some variation in practice in washing. The writer prefers to use water at 140 deg. Fahr. where it is available for three minutes, followed by cold water for three minutes. Soon after washing starts, the "extra stretch" is put on to take up the slack which appears after wetting the skeins. This extra half inch or so of "stretch" is supposed to help maintain the skeins at the proper length and to improve the luster.

Washing on the machine in the stretched condition is necessary in order to avoid the crumpling up of the skeins and to get the full luster. Regardless of the exact method of washing, this end will be attained when the caustic strength in the yarn is reduced from approximately 25 per cent, the mercerizing strength, to less than the minimum strength which will produce a mercerizing effect. If there is caustic anywhere in the yarn of 10 or 15 per cent solution strength, when the tension is taken off, the result will be faulty mercerizing. The washing should carry the caustic well below these figures.

An excessive washing time on the machine will waste heat and water, and worse than either, will cut down production. Too short a time will leave too much alkali in the yarn, and unless there is a wash between the machine and the sour, the result will be excessive neutralization and waste of acid. The yarn is sometimes given such a wash in water between the machine washing and the sour bath. It is neutralized in a sulphuric acid sour of 20 to 30 deg. Tw., then washed and finished according to whether it is to be bleached, dyed, or dried and shipped in the gray. These operations can be carried out in hand tubs or dyeing machines, and can be easily controlled by simple chemical tests.

Skein mercerizing machines are particularly useful in commission plants or mills where there are odd lots or small lots of special yarns to be mercerized. There are also manufacturers who consider skein mercerizing superior in luster to warp, and that the quality of the result justifies the somewhat higher cost of producing it.

The quality and uniformity of the work depend also on regular timing of the different steps in the process. This is comparatively easy on the electrically-driven machine with its small bank of push buttons. However, several users have devised complete automatic timing

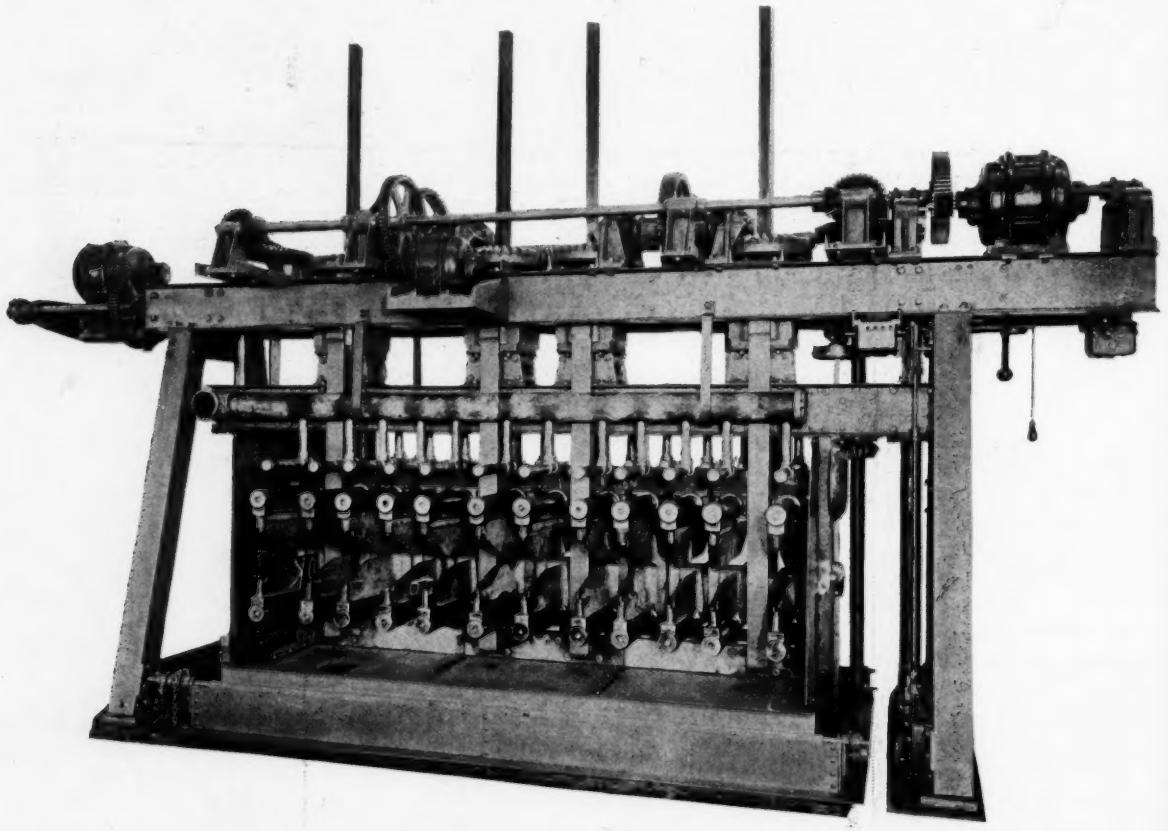


FIG. 1.—*Smith Drum Skein Mercerizing Machine*

where the pressing of a single button sets the three motors in operation at the proper time, reverses them when necessary, and in fact makes the whole process automatic.

The capacity of a 24-pole machine is 40 to 50 pounds per load or about 1,500 pounds of ordinary yarn in a ten-hour day.

There are other types of skein mercerizing machines and they all perform the same functions, whatever may be the plan of operations. There is one used particularly in foreign countries where the skeins are mounted on arms or rollers, given the proper stretch, and then moved around the machine stopping at different positions for soaking in the caustic, wringing between rollers, washing with hot water, then with cold, and finally moving automatically into position for doffing. Special features are the wringing which is claimed to reduce the caustic consumption to a very low figure, and the automatic "take-up" which maintains the tension as the yarn slacks off during washing. A modern Swiss machine of this type with a capacity of about 100 pounds per hour is shown in Fig. 2.

Skein machines, even though the yarn may travel through in a circle, are not continuous, but are batch machines. Large machines have been built on the principle of loading skeins on one end, and having them progress through the machine, coming off finished at some other position. It is doubtful if any such has been a complete success.

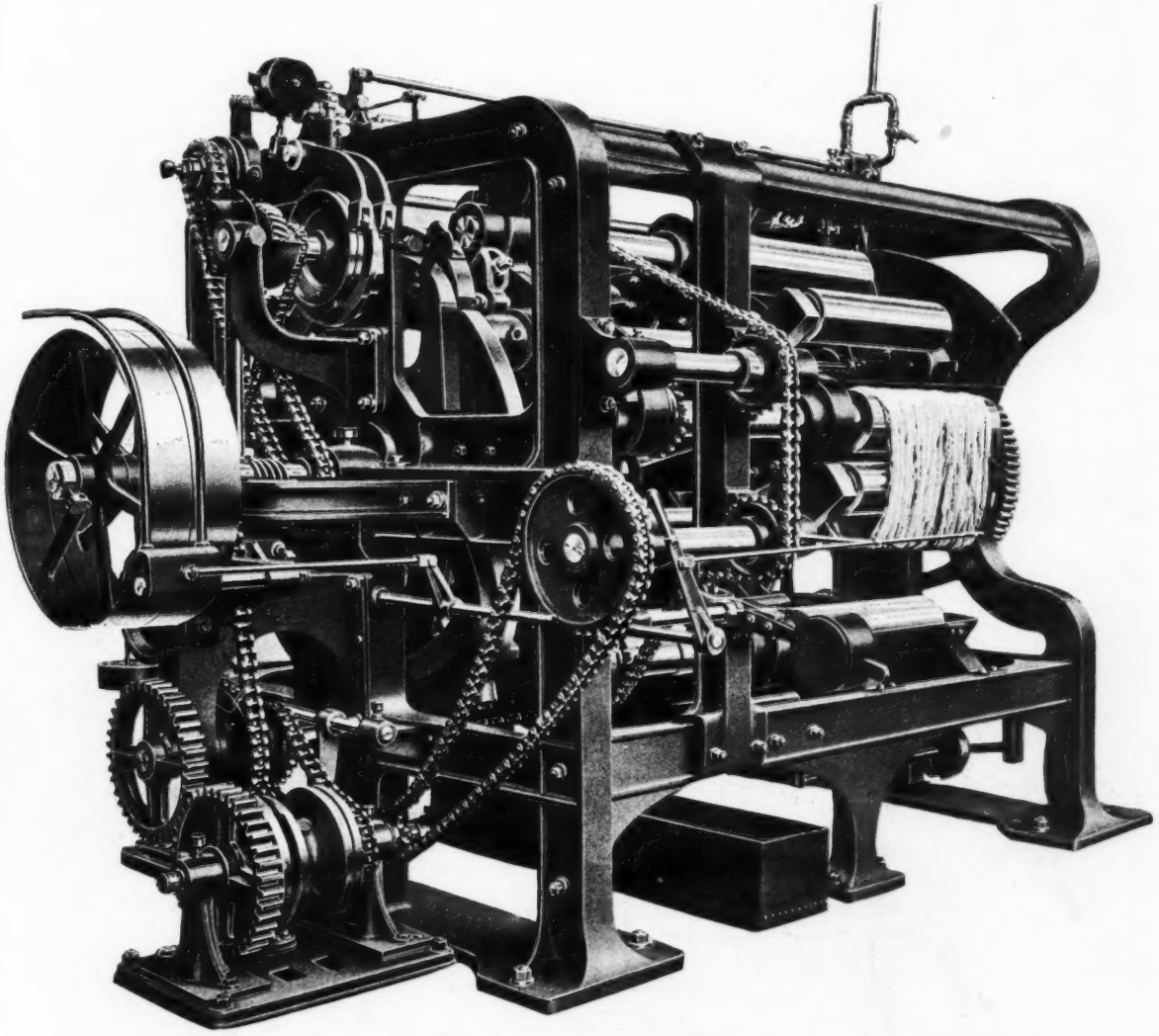


FIG. 2.—*A Modern Swiss Machine*

MERCERIZING OF WARPS

We now come to warp mercerizing which is a true continuous process. By far the larger share of commercial mercerizing is done in the warp form, because the ma-

chines have an extremely high capacity, and because the work goes through in such a uniform and positive fashion that there is very little chance for the troublesome variations that sometimes occur in skein work.

While warp mercerizing is considered by some to be not quite equal in luster to the highest class skeins, it is preferred especially for weaving and knitting, where even slight defects would show as light or dark streaks after dyeing.

The illustrations show several warp machines, which differ in some details, but are all the same in principle. From boiling out to dyeing is one continuous process with machinery in a single range.

The warp machines have to accomplish the same series of events as the skein mercerizers. They consist of series of usually fifteen to seventeen compartments, each equipped with guide and squeeze rollers. The yarn passes from one treating bath to the next and is held at proper tension throughout by the numerous rollers.

The warps come from the yarn manufacturers in "balls" of 378 ends and 6,000 yards in length. A single machine of ordinary width will take 48 warps of average size yarn. Since much warps are combined in groups or sets of three, it is evident that finer or heavier yarn can be run at the same time if the sets are made up with more of the finer warps or less of the heavier ones, as the case may be, so that all the sets have the same total size.

Since the separate compartments are each independent units, the machines can be planned and set up to suit the individual user. A representative arrangement will be briefly described.

The 48 (more or less) warps are all lined up on shells, and drawn through a binding machine. Here they pass through sixteen tubes, three warps to a tube, and have a binding cord passed spirally around them, its purpose being to keep any broken ends in place so that they cannot wrap around the rollers with consequent serious breaks and tangles.

Having been bound and properly guided into the machine, the next operation is boiling out. Ideas differ a little on this subject, but practically all that is required is a good wetting out. With the boiling temperature and squeeze rolls this is quickly effected in the two or three compartments assigned for the purpose. There is apparently no standard boiling solution, soda ash and Turkey Red Oil, dilute caustic soda, or caustic soda and oil

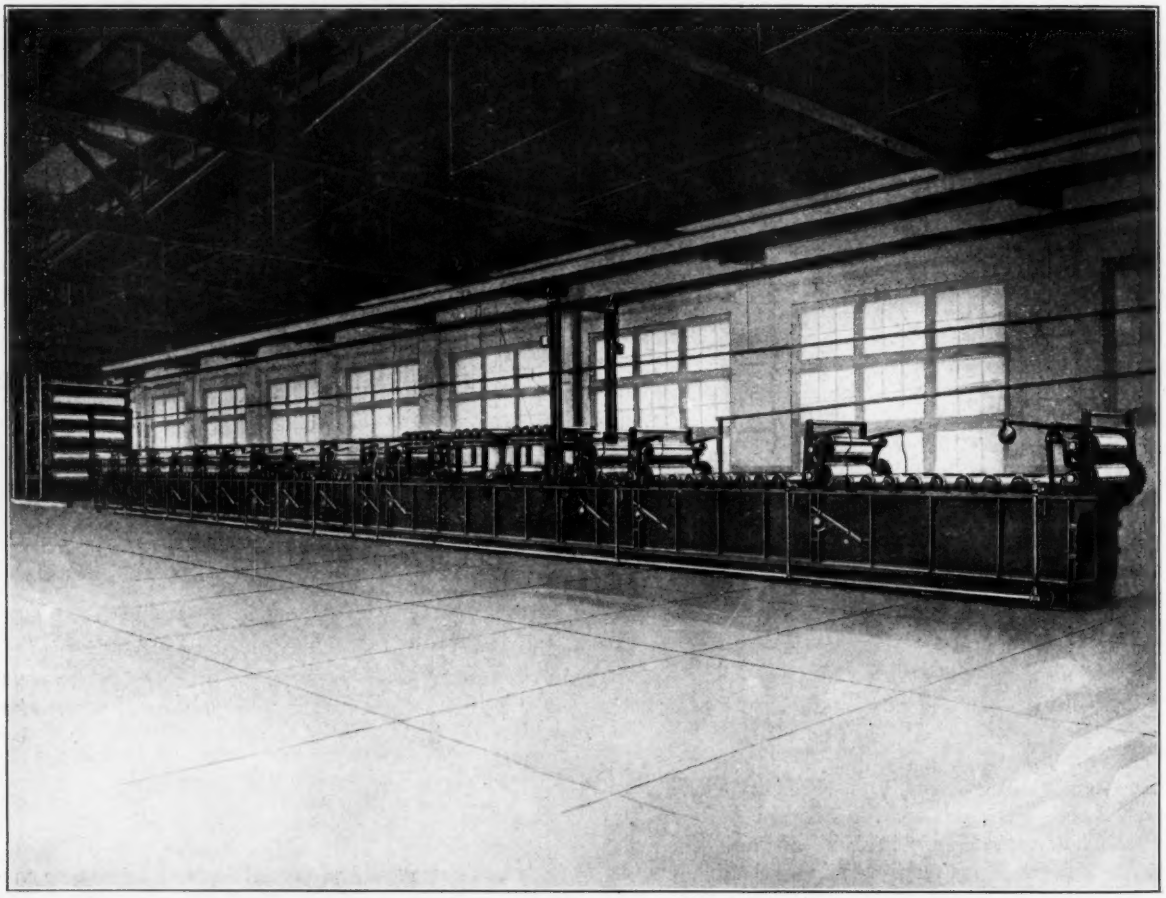


FIG. 3.—*Butterworth Warp Mercerizing Machine*

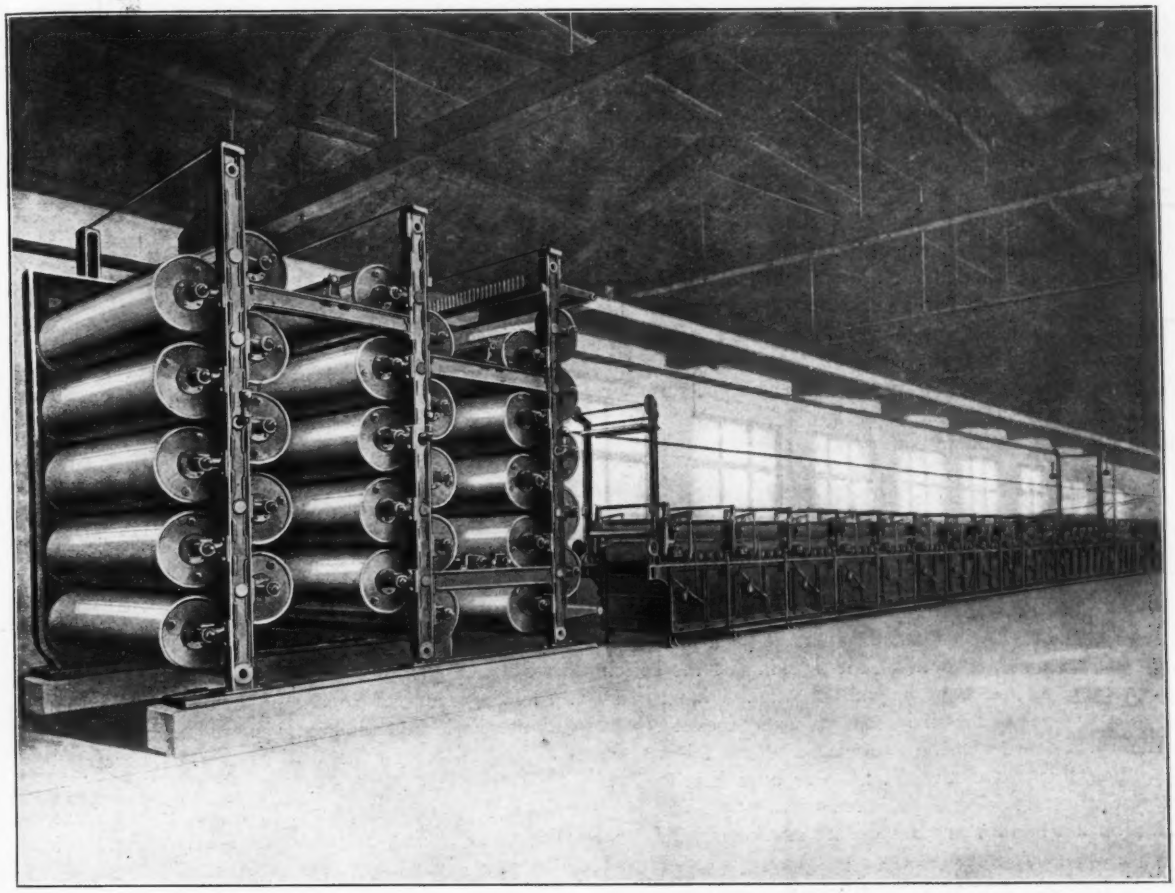


FIG. 4.—*Another View of the Butterworth Warp Mercerizing Machine*

being common. It is important to have a cold rinse between the boil-out and the mercerizing caustic.

The mercerization proper begins in the caustic tanks, of which there are usually three. In some machines the upper guide rollers are raised several feet above the body of the machine so that the yarn can get a longer caustic treatment without reducing the machine speed or increasing the number of compartments. Such extensions can be seen in Fig. 3.

In the best practice the caustic soda solution is made up in an outside mixing tank where it is maintained at the proper strength and kept cool, and from which it is circulated continuously through the machine.

The caustic is used at room temperature and at a strength of a little above 50 deg. Tw. The time of treatment is from two to three minutes, which is shorter than is usual in skein mercerizing, for the latter includes a wringing, as well as an immersion period, during which the yarn is subject to the full strength of caustic. There is the advantage, however, in the warp machine of squeeze rolls, which assist the thorough impregnation of the whole mass of yarn.

The mercerizing is completed in the rinsing which is done in the next three or four compartments with the yarn still under tension. The washing is supposed to do more than merely get the caustic out of the yarn, for if it can be done with a limited amount of water, a fairly strong by-product solution is obtained which can be used for dissolving fresh caustic or for concentration and recovery. Counter-current washing at 120 deg. Fahr. with a regulated amount of water can be made to yield a strength as high as 8 deg. Tw., and to carry the greater part of the used caustic to a recovery system.

The remaining operations are souring cold at about 3 per cent strength with sulphuric acid, washing out the acid, sometimes neutralizing with soda ash to catch any residual traces of acid, rinsing out excess of soda, and finishing with a softener if required.

The warps then pass directly over the dry cans, later to have the binder thread removed, to be split back to the separate warps and wound.

Compensating devices are provided at about two places in the range to help take care of any slight differences of speed that may develop in going through so many rollers in machines that are frequently 150 feet long.

The capacity of a single machine is something over 100,000 pounds per week, depending on the kind of yarn and hours of operating time.

There are opportunities for considerable study in devising the most practical and economical methods of neutralizing and washing, even when handling skein yarn in hand tubs. On the large scale it is worth while to circulate the acid continuously through the machines and a stock tank. In the latter it can be frequently tested by analysis or controlled by the more modern automatic electrical methods.

As an example of a smaller economy, also leading to a more scientific arrangement, the wash water following the sour can be carried back and applied to the washed mercerized yarn just before it enters the sour. This not only saves acid but introduces less chance of unduly weakening the sour bath by carrying caustic over into it. Similarly if soda is used for neutralizing traces of sour, the rinse water after the soda can be used in washing after the sour, reducing the chance of residual acid, as well as saving soda ash. Such ideas can be tested without much trouble, as there are simple methods of analysis to check them up to see if they really pay.

It will be noticed that successful yarn mercerizing has been all based on the principle of carrying the yarn through the caustic. The idea of circulating the caustic and other solutions, in turn, through the yarn has never been successful on account of the swelling of the cotton which prevents the liquors going through a hard mass of yarn, as well as the shrinkage. Caustic does not pass easily, as in filtering, through even one or two thicknesses of ordinary cotton cloth. The writer once heard of an interesting mercerizing experiment of this sort that was made on a Franklin process dyeing machine, which, of course, was never intended for any such purpose. It was said that the packages shrunk on so tightly to the spindles that it required a chain block to pull them off. The yarn was of no further use.

There are a great many opportunities for things to go wrong in ordinary routine mercerizing. Aside from machine difficulties which are peculiar to the particular equipment in use, there is more chance for trouble in skein than in warp mercerization, because the work is less automatic and depends more on the care and memory of the individual operators.

The quality of the result depends first on the yarn, for the most perfect processes cannot correct faults here. Length of staple and twist must be right, and not only that, but the yarn should be uniform in twist and size. For example, streaky effects in hosiery, which have been laid at first to the dyeing, have later been found due to places in the yarn that were finer and twisted differently from the average.

In mercerized yarns of natural color or bleached, slight irregularities are of little account as their effect on luster is hardly perceptible. If, however, the yarn is dyed, the smallest defects will show, especially if woven or knitted.

Mercerization appears to be a deep-seated physical change in the cotton that has as much effect on it as a chemical change. It depends so much upon tension that slight differences here will give pronounced uneven mercerizing, as, for instance, when skeins are not wound of uniform length or tension, or when they are carelessly loaded on the machine so that some ends are pulled tighter than others.

It almost goes without saying that incomplete impregnation with caustic will cause variable mercerization. Several other sources of trouble have already been suggested. Another that is sometimes difficult to locate is the leaving of traces of acid in the goods, when, upon dyeing, there will be serious and unaccountable light streaks that look as though they had never been mercerized.

Finally, there is uneven drying. The ends of threads, or single strands of yarn that is going wet from mercerizing to dyeing, may become dried out and will then give very pronounced light streaks. The reverse effect may be noted if wet spots are left in dried yarn, and it is then dyed. Such troubles will even appear if the yarn is first bleached and then dyed, showing that there is some quite fundamental difference in the cellulose.

There are rumors from time to time of new and wonderful machinery that is going to make great cuts in the cost of mercerizing. There may be possible improvements in working with skeins, but it is difficult to conceive of anything that can handle large scale work to much better advantage than the present warp mercerizing machines.

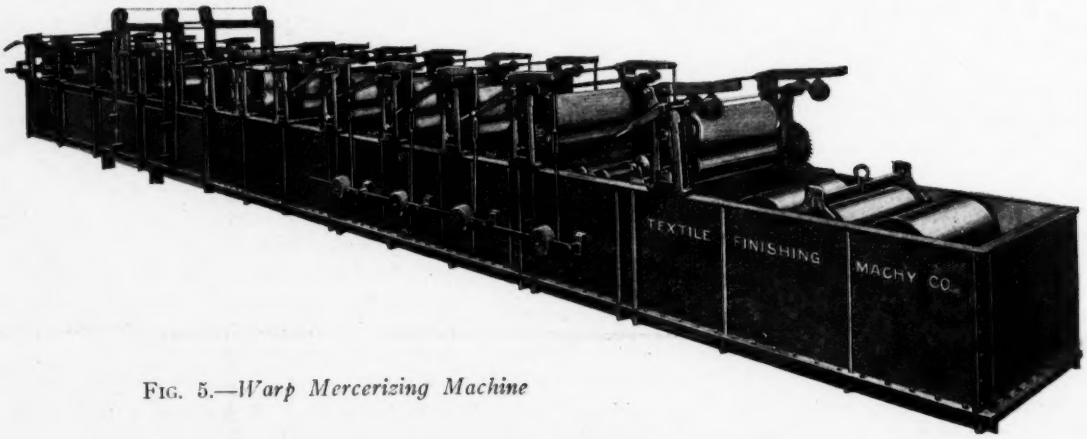


FIG. 5.—*Warp Mercerizing Machine*

The Penetrometer and Its Importance in Determining the Water Resistance of Fabrics

Four Necessary Characteristics of Method for Determination of Water Resistance—General Description of the Method—Increasing the Water Pressure—Details of the Apparatus—Disadvantages of Using Instrument on All Waterproofed Fabrics—Modified Type of Apparatus—Importance of Surface Tension—Impenetrability Measurer—The Kondratzky Apparatus

By N. N. WOSNESSENSKY

(Translated by Ismar Ginsberg, B. Sc., Chem. Eng.)

[TRANSLATOR'S NOTE.—*The article which follows is of Russian origin. It was originally published in the Reports of the All-Russian Textile Industry,* 1923, *pages* 11 *and* 19, *and translated into the German from which it is reproduced here. The article contains some valuable information on the testing of the water resistance of fabrics, and describes a very useful instrument for making this test.*]

THE methods that have been used for the determination of the waterproofing properties of a textile fabric—in other words, of the resistance of the fabric to the passage of water through its structure—must possess the four following characteristics in order to give accurate and reliable results:

1. The method must be sensitive enough so that any slight variation in the process which is being investigated will show a change in the effects that are produced in the test and in the instruments used therein.

2. The method and apparatus must permit the attainment of a high degree of accuracy.

3. The time that is consumed in making the test must be short.

4. The method and the apparatus must be free from subjective influences on the part of the experimenter and observer.

The new method and apparatus for measuring the water resistance of fabrics were developed with these principles in mind, and were eventually adopted by the Russian Commissariat and used by all the color chemists in that country.

GENERAL DESCRIPTION OF THE METHOD

Water is poured into a sack made of the material whose water-resisting powers are to be determined. The water is allowed to remain there for a period of twenty-four hours, and the penetrability of the water through the material of the sack and the capacity of the fabric for becoming wet with the water are noted at that time. It is plain that such a method does not fulfill the various conditions described above, for two reasons in particular. In the first place, the method is quite insensitive; and, secondly, it does not allow the degree of penetrability to be determined.

It is therefore impossible to compare the water-resisting properties of two different fabrics in this manner; nor is it possible actually to measure this property by such a method. Various other methods which were used in other countries seemed to suit the purpose better. For example, in addition to the "sack method" there was used a process in which there was measured a column of water, to which the cloth was subjected and through whose pores the water finally succeeded in penetrating. However, all such methods were found to possess one great disadvantage; namely, that the instrument or device used in the testing process had to be fixed in one place and could not be moved around.

THE PENETROMETER

In an experiment in Germany two communicating flasks were used. One of these flasks or vessels was fixed and the other was movable by means of suitable arrangement and connected with a rubber pipe. The pressure was measured by the difference in the levels of the water in the two flasks, the fabric that was being examined being fixed to the mouth of one of the flasks and the water pressure being transmitted to the surface of the fabric with which the water was in contact.

A much simpler arrangement, however, is to measure the column of water by means of a manometer, which is made in simple form from a piece of glass tubing and a centimeter scale. This simplified the apparatus considerably and it was no longer necessary to fix it permanently at one spot. The inventor of this apparatus called it the penetrometer. By such an apparatus is understood the type of water pressure measuring device which consists of a cylindrical flask on the top of which is fixed the piece of fabric being tested and at whose side is provided a vertical glass tube, from which it is possible to read the height of the water column, under the pressure of which the first drops of water were seen to penetrate through the upper side of the fabric. In other words, the maximum water resistance of the fabric was determined at the point when the first drop of water completely penetrated through the pores of the fabric and actually

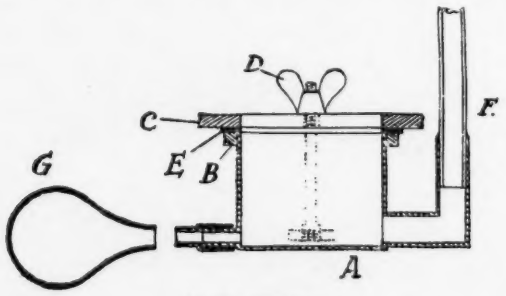
fell off on the surface of the fabric. The water pressure at that moment afforded a definite measure of the water-resisting powers of the fabric.

Increasing the Water Pressure

Different methods are available for increasing the pressure of the water employed in the waterproof tester. The simplest way is to pour in more water, thus increasing the height of the column that pushes up against the fabric, and thereby increasing the pressure of this water. But when this is done, it is afterwards necessary to remove the excess water from the apparatus through a special overflow cock. For this reason it is better to effect an increase in water pressure by increasing the pressure of the air over the column of water. This is done by means of a rubber bulb which is connected to the waterproofing tester. By simply squeezing the rubber bulb the air pressure is increased and the water pressure against the fabric under examination is likewise increased. When the pressure is released, the water recedes from the sample being tested, and it is easy to remove this sample and replace it with another, which is then tested in the same manner with the same quantity of water.

Details of the Apparatus

The details of this apparatus, illustrated herewith, are as follows: It is seen to consist of a copper cylindrical vessel, A in the figure, which has a diameter of 100 mm. A ring-shaped part, B, is fastened at the top of this cylinder and extends all around its circumference. On this is fastened a second metallic ring-shaped piece, C, which is held firmly to the vessel by means of the two clamps D. There is a rubber ring between these two rings and the sample of fabric to be tested is fastened between the two rings and the rubber ring washer. One advantage of this type of waterproofing tester is that it is not at all necessary to cut a sample of the fabric from the bolt of cloth; the whole piece can be tested by simply slipping one end of it into the tester. The vessel A is connected at one side to a glass tube F, which acts as a manometer. This tube has a diameter of 12 mm. and a height of 400 mm. On the other side the vessel A is connected with a rubber bulb, which has a capacity of 300 mm. The vessel is filled with water to the very edge, and the position of the tube F is adjusted so that the water level is at zero on the scale.



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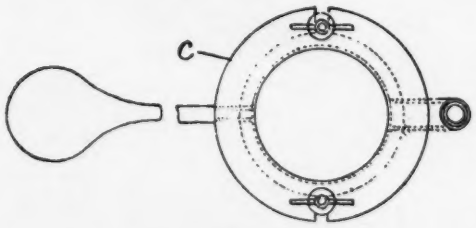

TOP VIEW

The Penetrometer

In using the penetrometer in testing the water-resistant properties of textile fabrics it is important that the fabric is uniformly woven throughout. In other words, it gives good results only when the entire body of the fabric has been treated alike; otherwise a part may be examined and results obtained which are not characteristic of the entire piece of goods. Of course, this applies to most any method and apparatus of testing textiles. There is still another condition, however, that must be taken into consideration when using this instrument: it must not be employed to determine the water-resisting properties of different fabrics which have not received the same waterproofing treatment. Thus, when it is used to examine waterproofed fabrics which have been subjected to impregnation with different waterproofing agents or which are processed quite differently, serious disadvantages are incurred.

Disadvantages of Using Instrument on All Waterproofed Fabrics

It must be remembered, first, that in this type of instrument the water remains unchanged from one test to the other. It is very seldom changed. When the waterproofed goods are tested, a certain amount of the impregnated materials dissolve in the water, and it is altogether possible that these substances, originally in the fabric and now dissolved in the water that is used in the penetrometer, may have a deleterious effect on the results obtained with that instrument in testing another piece of goods which have not been treated in the same manner as the first. Hence, there has been devised a modified form of the instrument in which water is added freshly each time that the instrument is used.

The general form of this apparatus is identical with that which has been explained above. The difference lies in the fact that arrangements are provided for adding and removing water from the instrument. In order to add water, the manometer tube to the right of the apparatus is lengthened so that its end comes directly under a water spigot. The main body of the instrument is filled to the top with water. Then

the sample of goods being tested is placed in the apparatus in the usual manner, with the right side of the goods facing downward and hence coming first in contact with the water, and then water is gradually added from the spigot, flowing down the manometer tube. The pressure exerted against the surface of the fabric being tested rises at the rate of 2 cm. of water per second for the first 10 cm. of water that is added. The amount of water thus added can be readily read off the graduated manometer tube. The work may be further simplified when the spigot through which the water flows into the open end of the manometer tube is so fixed that it will never allow more water to flow through it per second than corresponding to a rise of half a centimeter in the manometer tube. This can be done by fastening the spigot in a suitable manner so that it can never open more than enough to allow such a stream of water to flow from it. If this is done, then another spigot is employed for filling the tester after the water has been allowed to flow out of it.

The emptying of the vessel can be accomplished by connecting a cock at the left of the tester in the same place that the rubber bulb was attached, as shown in Fig. 1. This is done after the required amount of water pressure has been produced to force a drop of water through the structure of the fabric. When this occurs, the height of the water column in the manometer is read off the graduated scale. After the water has been allowed to flow out of the tester, fresh water is added, a new sample of cloth is fixed between the rings and the operation is repeated.

In some cases it is possible to arrange to fix the new sample of cloth between the rings on the tester and prepare it for testing by the time that enough water has flowed from the spigot to fill the apparatus. In such cases the flow of water from the spigot is uninterrupted at the rate of half a centimeter per second. This, of course, does not mean half a cubic centimeter but enough water to make the water level in the graduated manometer rise one division, the scale being divided into centimeters.

In adding new water to the apparatus the valve controlling the flow of water into the apparatus is closed just as soon as a column of water appears in the manometer and the increase in the pressure of the water against the surface of the cloth with which it comes in contact is perfectly controlled by means of the water cock which is located above the open end of the manometer tube and which remains open all the time that the tester is used.

It is sometimes inadvisable to take the appearance of the first drop of water on top of the cloth as the end of the test. There may have been a fault in weaving at this point which permitted the water to penetrate more easily than in other parts of the fabric. It is better to wait for the appearance of drops all over the surface before concluding that the test has been completed. Of course, inasmuch as the test is principally of a comparative nature it does not make very much difference what end-point is taken as long as the same one is taken in all the work done with the instrument.

The surface tension phenomenon of the water in the apparatus, which is controlled by its negative capillarity and in fine by the impenetrability of the fabric itself, is connected to a certain extent with the atmospheric pressure at the time that the instrument is being used. Hence, an unnecessary lengthening of the experiment exerts a certain influence on the results as long as a gas mixture is found in the air which lowers the surface tension of the fluid. This is rather aptly exemplified when the test is carried out in an atmosphere in which a certain amount of ether vapor is present, so that the fabric comes in contact with the vapor which is condensed upon it.

The Impenetrability Measure

This is an instrument which is also used for determining the water resistance of textile fabrics. It consists of a glass cylinder which has a height of 10 to 15 cm. and a diameter of 10 cm. The cylinder is open at both ends and is graduated into centimeters. A brass ring is fastened to the lower part of the cylinder and the sample of fabric which is to be tested is fastened to it. The water is then poured into the cylinder until it reaches a certain height. Then a brass disc covered with a piece of filter paper is arranged at a distance of 5 mm. from the lower end of the cylinder. The first drop of water that falls on this disc results in a connection being made with an electric circuit containing a battery and an electric bell is started ringing; at the same time a chronograph begins to operate. The disadvantage of this apparatus consists in the fact that it does not permit accurate measurement of the water resistance of fabrics being made. It is held that the time factor cannot be used as a standard unit for measuring the impenetrability of textile fabrics to moisture.

The Kondratzky Apparatus

This is an apparatus which has been used in Russia for determination of the degree of resistance of textile materials to water. It is also based on the pressure principle, the pressure unit being employed to designate the impenetrability of the fabrics to water. The difference between this instrument and the one that has just been described is that the pressure in this case is measured while a constant flow of water is taking place through the instrument. The pressure is increased by allowing the water to flow from the height of one meter through a tube which has an opening whose area is 0.05 sq. mm. After a period of two to four minutes has elapsed, drops of moisture appear on the surface of the fabric.

When this apparatus is compared with the pene-

(*Continued on page* 794)

Foreign Dyes Imported Through the Port of New York During October

Compiled by the Chemical Division of the Bureau of Foreign and Domestic Commerce in Collaboration with the Chemical Division of the United States Tariff Commission

KEY TO ABBREVIATIONS OF MANUFACTURERS' NAMES

1—THE SIX LEADING GERMAN COMPANIES

A—Actien-Gesellschaft fur Anilin-Fabrikation, Berlin. Founded 1873.
B—Badische Anilin-und-Soda-Fabrik, Ludwigshafen-on-the-Rhine. Founded 1865.
By—Farbenfabriken, vormals Friedr. Bayer & Co., Leverkusen-on-the-Rhine. Founded 1862.
C—Leopold Cassella & Co., Frankfort-on-the-Main. Founded 1870.
K—Kalle & Co., A. G., Biebrich-on-the-Rhine. Founded 1870.
M—Farbwerke, vormals Meister Lucius & Bruning, Hochst-on-the Main. Founded 1862.

2—THE SMALLER GERMAN COMPANIES

BK—Leipziger Anilinfabrik Boyer & Kegel, Furstenberg, near Leipzig. Founded 1882.
CG—Chemikaliewerk Griesheim G. m. b. H., Griesheim-on-the-Main. Founded 1882.
CJ—Carl Jager G. m. b. H., Anilinfarbenfabrik, Dusseldorf. Founded 1823
GrE—Chemische Fabrik Griesheim-Electron, Offenbach-on-the-Main. Founded 1842.
L—Farbwerk Mulheim, vormals A. Leonhardt & Co., Mulheim-on-the-Main. Founded 1879
tM—Chemische Fabriken, vormals Weiler ter Meer, Uerdingen-on-the-Rhine. Founded 1877.
WD—Wulfing, Dahl & Co., A. G. Barmen. Founded 1842.

3—SWISS COMPANIES (ALL AT BASEL)

DH—Farbwerke vormals L. Durand, Huguenin & Co. Founded 1871.
G—Anilinfarben-und Extract-Fabriken, vormals Joh. Rud. Geigy. Founded 1764.
I—Gesellschaft fur chemische Industrie. Founded 1885.
S—Chemische Fabrik, vormals Sandoz & Co. Founded 1887.

4—DUTCH AND FRENCH COMPANIES

FA—Farbwerk Ammersfoort, Ammersfoort, Netherlands. Founded 1888
NF—Niederlandische Farben-und-Chemikalienfabrik Delft, Delft, Netherlands. Founded 1897.
CN—Compagnie Nationale de Matieres Colorantes et Produits Chimiques. Founded 1917. (Etablissements Kuhlmann merged with this company in 1923.)
P—Societe Anonyme des Matieres Colorantes et Produits Chimiques St. Denis (formerly A. Poirrier). Founded 1830.

5—ENGLISH COMPANIES

Bro—Brotherton & Co., Ltd., City Chambers, Leeds.
BAC—British Alizarine Co., Ltd., Manchester
BD—British Dyestuffs Corporation, Ltd., London.
Cl Co.—The Clayton Aniline Co., Ltd., Clayton, Manchester.
CV—The Colne Vale Dye & Chemical Co., Ltd., Milnsbridge, Huddersfield.
Hol—L. B. Holliday & Co., Ltd., Huddersfield.
Scot—Scottish Dyes, Ltd., Grangemouth.

THE imports of coal-tar dyes for October, 1924, through the port of New York totaled 440,466 pounds, with an invoice value of $455,787. In addition, the imports of dyes through other ports included: Providence, 135,140 pounds, with an invoice value of $148,532; Boston, 1,356 pounds, with an invoice value of $935; Hartford, 500 pounds, with an invoice value of $490; Chicago, 55 pounds, with an invoice value of $117, and Detroit, 25 pounds, with an invoice value of $198.

The total imports of dyes reported from six ports in the United States for the month of October were 577,542 pounds, with an invoice value of $606,059.

Imports of Dyes Through the Port of New York, 1924

Month	Pounds	Value
January	288,743	$232,571
February	158,874	176,657
March	293,862	302,016
April	174,880	182,253
May	167,245	165,521
June	147,380	151,331
July	140,810	137,075
August	64,546	71,290
September	152,978	159,620
October	440,466	455,787

The dyes in this report are grouped by Schultz numbers, and in the case of those which could not be identified by Schultz number the classification according to the ordinary method of application was adopted. As the pastes and powders of the vat dyes vary widely in strength and quantity, each vat dye has been reduced—in nearly every case—to a single-strength basis.

The designation of "†" for competitive and "*" for non-competitive indicates the appraisement basis for the assessment of the ad valorem duty in paragraph 28 of the Tariff Act of 1922. Those dyes without designation are doubtful, pending furtrer investigation.

The ad valorem rate for competitive dyes is based on the American selling price as defined in Subdivision (f) of Section 402 of Title IV; the ad valorem rate for non-competitive dyes is based on the United States value as defined in Subdivision (d) of Section 402 of Title IV of the Tariff Act of 1922.

DYES OF COAL-TAR ORIGIN

Schultz No.	Name of Dye and Manufacturer	Quantity (pounds)
10	Stilbene Yellow	225
	Mikado Yellow—(Q)	
19	Fast Light Yellow	2,402
	Fast Light Yellow 3G—(By)	
	Kiton Fast Yellow 3G—(I)	

Schultz No.	Name of Dye and Manufacturer	Quantity (pounds)
22	Xylene Light Yellow	5,000
	Xylene Light Yellow 2G Conc.—(S)	
58	Alizarine Yellow R	500
	*Ultra Orange R—(S)	
74	Tannin Orange R	500
	*Tannin Orange R Powder—(C)	
82	Ponceau R	300
	*Scarlet 2R—(S)	
88	Acid Anthracene Brown	1,147
	*Acid Anthracene Brown PG—(By)	
121	Erica B	600
	†Erica B Conc.—(S)	
	Erica B Extra—(A)	
140	Curcumeine	1,102
	*Chromocitronine R—(DH)	
141	Azo Yellow	300
	*Indian Yellow FF—(C)	
175	Ponceau for Silk	110
	*Acid Ponceau E—(G)	
180	Eriochrome Blue Black BC—(G)	10
182	Brilliant Sulphon Red	1,000
	†Brilliant Sulphon Red B—(S)	
207	Diphenyl Fast Brown	2,756
	Diphenyl Fast Brown GF—(G)	
	*Diphenyl Fast Brown GNC—(G)	
221	Anthracene Acid Brown	10
	*Anthracene Acid Brown G—(C)	
227	Brilliant Croceine	25
	Cotton Scarlet Extra—(B)	
232	Sudan IV	100
	*Biebrich Scarlet R—(K)	
257	Sulphon Cyanine	100
	Sulphon Cyanine G—(By)	
265	Sulphon Cyanine Black	3,686
	†Sulphonine Black B—(S)	
	†Acid Milling Black B—(G)	
273	Diaminogene Blue	5,400
	*Diaminogene Blue NA—(C)	
	*Diaminogene Blue NBB—(C)	
274	Diaminogene	18,400
	*Black Extra—(C)	
	*Diaminogene Extra—(C)	
279	Benzo Fast Scarlet	2,400
	†Benzo Fast Scarlet 5BS—(By)	
	Direct Fast Scarlet SE—(I)	
293	Milling Red	441
	†Acid Milling Red G Conc.—(G)	
296	Cotton Yellow	969
	†Benzo Fast Yellow RL—(By)	
	†Benzo Fast Yellow 4GL—(By)	
	Fast Cotton Yellow RL—(A)	
304	Chrysophenine	594
	Direct Yellow CH—(I)	
319	Diamine Scarlet	1,125
	*Diamine Scarlet B—(C)	
	*Diamine Scarlet 3B—(C)	
	*Universal Bordeaux C—(C)	
327	Diamine Violet N	15
	*Universal Violet C—(C)	
330	Zambesi Brown	10
	Zambesi Brown 2G—(A)	
333	Diamine Black	50
	*Direct Black RMW—(C)	
343	Diamine Fast Red	440
	†Diamine Fast Red 8BL—(C)	
344	Diamine Brown	15
	*Universal Dark Brown C—(C)	
348	Diphenyl Brown BN	4,409
	*Diphenyl Brown BBNC—(G)	
	Diphenyl Brown GS—(G)	
349	Diamine Brown B	15
	*Universal Olive Brown C—(C)	
362	Oxydiamine Orange	50
	†Toluylene Orange R Conc.—(S)	
363	Benzopurpurine 4B	25
	*Universal Scarlet C—(C)	
370	Brilliant Congo	50
	Brilliant Congo R—(A)	
392	Toluylene Orange	1,000
	*Pyrazol Orange G Conc.—(S)	
400	Acid Anthracene Red	200
	Acid Anthracene Red 3B—(By)	
415	Dianil Blue G	25
	*Universal Light Blue C—(C)	
423	Chicago Blue B	15
	*Universal Steel Blue C—(C)	
424	Chicago Blue 6B	25
	Minaxo Pure Blue 6B Conc.—(B)	
448	Diamine Bronze	1,200
	*Diamine Bronze G—(C)	
456	Benzo Fast Blue	868
	†Benzo Fast Blue 4GL—(By)	
457	Trisulphon Brown GG	5,000
	*Trisulphon Brown GG Conc.—(S)	
459	Benzo Black Blue G	15
	*Universal Dark Blue C—(C)	
474	Oxamine Green B	15
	*Universal Dark Green C—(C)	
476	Benzamine Brown 3GO	220
	Cupranil Brown G—(I)	
477	Congo Brown	25
	Congo Brown G—(A)	
496	Setoglaucine	1,102
	*Setoglaucine 753—(G)	
501	Brilliant Glacier Blue—(I)	110
503	Neptune Green	851
	Brilliant Milling Green B—(C)	
	†Erioviridine B Supra—(G)	
505	Light Green SF (Yellowish)	500
	Acid Green Conc.—(M)	

Schultz No.	Name of Dye and Manufacturer	Quantity (pounds)
506	Erioglaucine	100
	Brilliant Acid Blue EG—(By)	
507	Xylene Blue VS	1,927
	Xylene Blue VS Conc.—(S)	
508	Xylene Blue AS	1,000
	†Xylene Blue AS Conc.—(S)	
512	Magenta	155
	Magenta S—(B)	
	Fuchsine N—(Q)	
516	Crystal Violet	422
	Crystal Violet Extra—(B)	
	†Crystal Violet P—(By)	
523	Fast Green	468
	Fast Green Extra Bluish—(By)	
530	Acid Violet	1,230
	Acid Violet 4BLO—(B)	
	Acid Violet 6B—(t-M)	
	*Formyl Violet S4B—(C)	
537	Methyl Blue for Silk	551
	Methyl Lyons Blue—(G)	
	Methyl Silk Blue New—(G)	
539	Soluble Blue	55
	Water Blue—(Gr-E)	
541	Brilliant Dianil Blue 6G—(M)	100
543	Patent Blue	1,668
	Patent Blue V—(M)	
	Poseidon Blue BGX Conc.—(B)	
545	Patent Blue A	1,235
	*Brilliant Acid Blue FF—(By)	
	Neptune Blue BR Conc.—(M)	
	*Poseidon Blue BR Extra—(B)	
546	Cyanol	505
	Blue Extra—(C)	
551	Eriochrome Azurol BC	3,858
	*Eriochrome Azurol BC—(G)	
552	Chromal Blue	331
	Chromal Blue GC—(G)	
557	*Chrome Violet—(G)	110
558	Victoria Blue R—(I)	330
559	Victoria Blue B	435
	Victoria Blue B Base—(CN)	
	Victoria Pure Blue BO—(B)	
562	Fast Acid Blue	499
	*Brilliant Wool Blue FFR—(By)	
564	Naphthalene Green	551
	Erio Green B Supra—(G)	
569	Acridine Red	55
	Acridine Red 3B—(L)	
571	Rhodamine 6G	535
	Rhodamine 6GDN—(B)	
	*Rhodamine 6GDN Extra—(B)	
	*Rhodamine 6GDN Extra—(By)	
	*Rosazeine 6GD Extra—(M)	
573	Rhodamine B	4,715
	Rhodamine B—(B)	
	Rhodamine B Extra—(Q)	
	Rhodamine B Extra—(I)	
581	Fast Acid Phloxine A	5
	Fast Acid Eosine G—(M)	
582	Fast Acid Violet A2R	25
	Fast Acid Violet RGE—(M))	
592	Erythrosine	30
	*Erythrosine—(M)	
	†Erythrosine Extra—(M)	
603	Acridine Orange	1,101
	Acridine Orange DHE—(DH)	
	Brilliant Acridine Orange A—(DH)	
606	Phosphine	4,601
	*Acid Phosphine R—(BD)	
	Patent Phosphine M—(I)	
	Philadelphia Yellow—(A)	
	Phosphine 3R—(A)	
	†Coriphosphine OX—(By)	
607	Rheonine	300
	Runic AL Conc.—(B)	
608	Euchrysine	1,360
	Patent Phosphine GRNTN—(B)	
609	Homophosphine	100
	Flavophosphine G Conc.—(M)	
612	Quinoline (spirit soluble)	1,256
	†Chinoline Yellow Conc.—(S)	
613	Quinoline (water soluble)	200
	Chinoline Yellow KT Conc.—(B)	
617	Columbia Yellow	848
	Chloramine Yellow GG—(By)	
	Diphenyl Chlorine Yellow FF—(G)	
	*Universal Yellow C—(C)	
618	Thioflavine T	5,790
	*Basic Yellow T—(C)	
	Thioflavine T—(C)	
	*Yellow T—(C)	
622	Delphine Blue B	2,605
	*Brilliant Delphine Blue B—(S)	
	Delphine Blue B—(I)	
624	Modern Violet N Extra—(DH)	110
625	Chrome Heliotrope	110
	Modern Heliotrope DH—(DH)	
635	Modern Violet	495
	*Gallo Violet DF Powder—(By)	
	*Modern Violet—(DH)	
644	Ultracyanine R, B	500
	*Ultracyanine RB—(S)	
645	Gallazine	441
	Gallazine No. 9—(DH)	
660	Methylene Green	100
	†Methylene Green G Extra—(C)	
661	Thionine Blue	551
	Thionine Blue G—(I)	
663	New Methylene Blue	100
	*New Methylene Blue N—(C)	
667	Indochromine	500
	*Indochromine RR Conc.—(S)	

(*Continued on page* 799)

Proceedings of the American Association of Textile Chemists and Colorists

The American Association of Textile Chemists and Colorists

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Percival Theel, Secretary, Philadelphia Textile School, Philadelphia, Pa.

NOVEMBER MEETING OF THE PHILADELPHIA SECTION

The regular November meeting of the Philadelphia Section of the American Association of Textile Chemists and Colorists was held in Philadelphia, November 14, 1924.

The regular meeting was proceeded by a meeting of the various committees in charge of arrangements for the annual meeting of the association on December 6th at which final details were arranged.

At 6.30 p. m., following the meeting of the committees, the usual informal dinner was held at the City Club of Philadelphia.

The meeting proper was called to order by the Chairman, Dr. Chas. S. Hollander, at 8.30 p. m. in the auditorium of the Philadelphia Textile School.

The minutes of the previous meeting were read and approved as read.

Dr. Hollander then briefly announced the details of the program for the Annual Meeting as arranged by the Section.

The following nomination committee was appointed by Dr. Hollander and instructed to submit nominations for the Section Officers and Committee at the December meeting of the Section: Messrs. Mullin, Archer and Theel.

There being no further business Dr. Hollander then introduced R. C. Jefferson of the R. C. Jefferson Company, of Philadelphia, who read a very interesting paper, "Kiers: Their Relation to Cotton Finishing."

On motion of Mr. Bertolet a rising vote of thanks was tendered the speaker of the evening.

The meeting adjourned at 10 p. m.

There were thirty present.

PERCIVAL THEEL,
Secretary Philadelphia Section.

KIERS: THEIR RELATION TO COTTON FINISHING*

By R. C. JEFFERSON

Of the R. C. Jefferson Company, of Philadelphia.

Kiers, the machine, and kier boiling, the subject, are both a much abused thing, the machine because it is huge, bulky and subject to many vagaries and whims, turning out its product in a satisfactory manner, then going on strike, as it were, for no apparent reason and causing much heartache to those responsible for good results. Kier boiling, the subject, is abused because of the same vagaries and whims. The theory of boiling and the chemistry of the action of caustic on the various oils, resins and waxes in the cotton fiber is thoroughly understood and, as such subjects go, is extremely simple, but when applied in actual practice where great quantities of material must be processed at the same time, therein lies the source of the aforementioned whims. In later years more thought has been given to these machines, and more care as to the places wherein they are housed so that the machine may be helped instead of hindered in its important work. We mentioned before that most of the difficulty encountered in kier boiling was due to the fact

*A paper presented before the Philadelphia Section of the American Association of Textile Chemists and Colorists, November 14, 1924.

that we are performing the operation in such quantities. I ask that you give thought to this: where else in the textile industry do we ask machines to perform or help to perform a chemical action of such importance as this one, on such a large scale and in such tightly packed and confined quarters? Compare it for a moment to the kindred operation of cleaning the wool fiber, during which process the material is kept open as much as possible in spite of the fact that most of the wool impurities are on the very surface waiting to be knocked and washed off, as in comparison to the impurities in the cotton where the very heart of each fiber must be reached in order to keep the final result permanent, whether it be a white or a color.

What I have said already may sound more like an apology for kiers than a talk upon them, but I am wondering if I can raise the same question in your minds that is in mine: why were men, vitally interested in the operation of these machines, so loath to consider them at any length or even to recognize them as machines at all but merely as tanks or kettles which were one of the things about the mill put there to worry the owner and operator and take the joy out of their lives? Up until a very short time ago, if a mill was in need of a new kier, the man making the purchase would obtain prices and capacities from boiler houses and place their order, but let the same mill become interested in a new wool scouring outfit, would they go to a foundry and have them cast? No. They would go to the leading makers who specialized in this machine and they would visit other mills to compare results; they would ask their friends advice and in many ways try to get the best machine that money could buy. As I have intimated, this condition is not so marked now and most everyone has come to realize that a kier is a machine, a very importantt machine and a machine that it pays to give a good deal of attention to, thereby saving countless money which would otherwise be wasted.

There are many kiers on the market to-day, the kier itself being practically the same as it always has been as to shape and size, but the method of circulating the liquid through the goods has been improved upon since the time mill-men took interest in the machine, providing an incentive for someone to spend time and money upon the subject. Roughly there are three different principles upon which the circulation is brought about; there is the center vomit principle, the pump principle and the injector principle. The injector principle, while being used to some extent, has had its limitations and is not extremely popular; the pump principle, while one of the oldest, is still in use, but has not been improved upon to any extent, at the same time it is being used in quite a number of mills; the center vomit principle is also one of the oldest principles and in its original form is not being used by up-to-date mills but an improvement or evolution of this principle is to-day the most popular of all the kiers. This kier is known to the trade as the Jefferson kier and has been on the market for approximately twenty-five years. The inventor, originally a steam engineer, was installing in a large New England bleachery some improvements to the steam and power plants, and after completion, which contained many original ideas, the mill realized a tremondous saving in coal, putting the plant on an operating basis second to none and much higher than most of their competitors. Naturally this was pleasing to the manager and in a joking way he said that if someone could only cut the steam consumption of his kiers, then indeed would he be perfectly happy. After asking what the kiers were for, how they were run and why they could not be run this way and that, the inventor started to think the matter out. It was some months before the idea came of how the action of the center vomit kier could be duplicated without leaving a vent open to the air, but eventually he got it and this same idea with some changes and improvements has remained to this time.

It is not my intention to sell any kiers this evening, but by giving you combative arguments you probably will get the most comprehensive idea of the different machines. Comparing the Jefferson kier to the center vomit kier as far as results to the cotton is concerned, there is little to say, as I mentioned before, one being the evolution of the other. It is reasonable to assume that if the center vomit is run properly it will give as good work as the Jefferson, but the steam saving of the Jefferson over the center vomit will run between 60 and 80 per cent.

The injector type kier, as I mentioned before, is not used at this time to any extent, but what tests have been made show anywhere from 30 to 60 per cent steam saving in favor of the Jefferson kier. The pump kiers are pushed to-day with much more enthusiasm than any of the other types, and are made by various manufacturers in two distinct types, one where the heat is introduced by bringing steam directly into the boil-off liquor and the other by heating this liquor indirectly by means of special heaters or steam jacketed pipes. With either of the above types, the Jefferson kier has consistently shown steam savings, and where exhaustive tests have been run the quality of the work produced has been in favor of the Jefferson kier, the popularity of which has steadily increased until approximately one-half the kiers in this country are equipped with this system of circulation.

I will mention some of the arguments which have been used as talking points against the Jefferson kier, one being that the liquor line which does not cover the goods but is at a point slightly over half-way of the contents, is too low and harm will be done to the portion above

the liquor line. The reason harm is not done to this portion is easily explained but the quickest way to refute this assertion is to bring to the attention that this kier could hardly be used by anyone if this were the case, but as a matter of fact is being used by so many, some of whom have the reputation of turning out the finest quality of work in the world. Another argument is the fact that steam is introduced directly into the kier, weakening the solution and the liability of carrying foreign matter in on the goods. This, of course, does not bear much analysis, because if steam is of such poor quality or has a tendency to carry over harmful contents it could hardly be expected to make a success of the plant, as there are many other places where, of necessity, the steam must come in contact with the goods. As to the weakening of liquor, it must be remembered that the strength of chemicals was figured out on the weight of the goods so that in the case of the Jefferson kier, where the liquor line was started at approximately one-half the depth of the kier at the end of the boil, it is not as much in volume as the other kier was at the start. This weakening of the liquor is rather beneficial than otherwise, because as the waxes begin to loosen and disappear, the cotton is not being subjected to as strong a solution. Arguments, like political talks, can be given in countless numbers and made to serve the particular ends of the one giving them, but the real test comes in the ultimate performance and results. This, with the Jefferson kier, has been the large factor, no claims or statements were ever made which the manufacturers were not able to back up after installation. I might go further and say that they insist upon making good their claims, and each installation has been followed by someone going into the plant, seeing that the machine was right, giving instructions in proper operation, and making suggestions, gathered from years of experience, which would help the customer over many of his aggravating troubles.

OCTOBER MEETING OF THE RHODE ISLAND SECTION

The October meeting of the Rhode Island Section of the American Association of Textile Chemists and Colorists was held in the rooms of the Providence Engineering Society, 44 Washington Street, Providence, R. I., Friday evening, October 31, 1924.

Chairman Culver called the meeting to order at 8.15 p. m.

All members were urged to be present at the Annual Meeting of the Association to be held at Philadelphia, December 5 and 6.

The speakers of the evening were: Professor Harold Hibbert, Associate Professor of Applied Chemistry at Yale University, and Dr. W. O. Mitscherling of the Max Ames Machine Company, Bridgeport, Conn., their subject being "Artificial Silk and Other Developments in the Utilization of Cotton and Wood Cellulose."

Professor Hibbert dealt wholly with the chemistry of the subject, explaining the difference in the chemical construction of silk and the various artificial ones. His talk on colloidal chemistry was a treat and highly appreciated by all present.

Dr. W. O. Mitscherling most ably supplemented Professor Hibbert's talk with the help of lantern slides, blue prints and a working model showing the manufacture of Celanese silk.

The model machine in which the actual making of the thread took place had been set up previous to the meeting and was shown publicly here for the first time and created much interest.

Respectfully submitted,

ALLISON R. FLETCHER, Secretary.

PROGRAM OF THE FOURTH ANNUAL MEETING

The following is an announcement of the full program planned for the Fourth Annual Meeting of the American Association of Textile Chemists and Colorists to be held in the Bellevue-Stratford Hotel in Philadelphia, December 5 and 6:

Friday Afternoon, December 5.—Meeting of the Council and Research Committee at the Bellevue-Stratford Hotel at 3 p.m.

Friday Evening.—Get-together meeting and smoker. The membership is urged to arrange to arrive in Philadelphia as early as possible on Friday evening, as facilities have been arranged for a get-together meeting and smoker of all of the members. This feature will facilitate the getting acquainted of the members from the various parts of the country. Samples of Philadelphia's unique textile industry will be on exhibition, and this, together with a little entertainment, light refreshments and smokes, will make the evening enjoyable. Members should immediately register with the Secretary upon arrival.

Saturday Morning, December 6.—Morning Session. The morning session will open at 9.30 at which time the annual business meeting will be held. The business meeting will be followed by reports of the following subcommittees: Committee on Fastness to Light, Wm. H. Cady, Chairman; Committee on Fastness to Perspiration, Hugh Christison, Chairman; Committee on Fastness of Alkalis and Acids, Including Carbonization, Wm. R. Moorhouse, Chairman. After the business meeting and reports of the committees the following papers will be presented: Experiences with Micro-Organisms and Insects in Textile Work, Arthur K. Johnson; The Value of Spectrographic Work in Connection with Dyes, Edwin G. Priest; Naphthol AS and BS Colors and Their Application, Dr. R. E. Rose; Mercerization of Cotton Piece

Goods, W. W. Chase; Indigisol O and Other Indigisol Colors, C. W. Kuhl, President Carbic Color & Chemical Company, Inc. The following subjects will be discussed if time permits: The Dyeing of Three Fiber Hosiery. Recent Progress in the American Dye Industry, Speed Limit of Successful Dyeing of Piece Goods.

Saturday Afternoon Session, 2 o'clock—Auditorium of the Philadelphia Textile School. Symposium on Artificial Silk. The subject will be introduced by a paper presented by Prof. Harold Hibbert of Yale University. Prof. Hibbert will discuss the composition and properties of the various types of artificial silk and will illustrate his talk by a silk spinning machine in actual operation. Prof. Hibbert's talk will be followed by discussions of the individual types of artificial silk as follows: Viscose Silk, W. W. Cooper, Viscose Company; Nitro Cellulose Silk (Tubize), not positive of speaker; Cellulose Acetate (Celanese), H. Platt, the American Cellulose & Chemical Company; Cellulose Acetate (Lustron), "The Use of Lustron as a Decorating Fiber," Royal D. Little, the Lustron Company; Cupra Ammonium Silk, R. P. Dick, President Cupra, Inc. It is earnestly desired and requested that members who expect to attend the meeting will read over this program and come prepared to discuss as far as possible any of the subjects in which they are interested, or in regard to which they have had special experience.

Saturday Evening Session, 7.30 o'clock.—Banquet Bellevue-Stratford Hotel. The annual banquet will be held at 7.30 and the speakers will be: Prof. Louis A. Olney, President of our Association; Hon. W. Freeland Kendrick, Mayor of Philadelphia; Chas. J. Webb, President of the Philadelphia Textile Manufacturers' Association; Warren E. Embley of the Department of Commerce.

APPLICANTS FOR MEMBERSHIP

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Martin, H. W., manager, Kuttroff, Pickhardt & Co., Inc., Philadelphia, Pa. Sponsors: B. Kendall Archer and E. C. Bertolet.

Pettingill, Lee D., dyer, Lewiston Bleachery & Dye Works, Lewiston, Me. Sponsors: E. W. Adams and Wm. R. Moorhouse.

Snoop, John, colorist, Consolidated Piece Dye Works, Paterson, N. J. Sponsors: D. A. Pfister and S. F. Carter.

Ulmes, August, textile colorist, Calco Chemical Company, Bound Brook, N. J. Sponsors: R. R. Sleeper and R. Alvater.

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CHANGES OF ADDRESS

Archer, B. K., 304 Highway, Riverton, N. J.

Brainerd, Carroll L., 98 Spring Street, Passaic, N. J.

Chen, W. P., State College, Raleigh, N. C.

Dick, J. B., 170 Broadway, Norwich, Conn.

Thompson, A. R. Jr., 605 Johnson Bldg., Charlotte, N. C.

THE Annual Meeting of the American Association of Textile Chemists and Colorists will be held in Philadelphia, with headquarters at the Bellevue Stratford Hotel, on Saturday, Dec. 6th, 1924

A number of unusually good papers will be presented during the Saturday morning and afternoon sessions and there will be several speakers of national reputation at the banquet in the evening.

A pleasant surprise will be in store for those who can arrange to arrive in time for the "Get-Together Smoker" on Friday evening, December 5th, which will also be held in the Bellevue Stratford Hotel.

AMERICAN
DYESTUFF REPORTER

Devoted to the use and application of dyestuffs and the mechanical equipment incidental thereto.

LOUIS A. OLNEY
PROFESSOR OF CHEMISTRY AND DYEING, LOWELL TEXTILE SCHOOL
Directing Editor

CLAYTON HOAGLAND
Managing Editor

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SHIFTING ORDERS—THE DYESTUFF MANUFACTURER'S OPPORTUNITY

THE wave of business optimism that started rolling across the country in August and September was not *wholly* responsible for the decidedly upward trend of business that followed. The growing volume of actual dollar-and-cents business and the nationwide resumption of industry were due largely to infallible economic laws. Because these laws are so sound, so invariable in their functioning, business men now firmly believe not only that 1925 will be a prosperous year, but also that the present business revival has something substantial back of it, that it is not a temporary revival. Having finally reached this most encouraging conclusion, they are energetically working to earn their share of the prosperity which they see ahead. It is with certain methods and means employed by dyestuff manufacturers during this period of buying and selling activity that this editorial is concerned.

During the dull summer months the mills reflected the passive attitude of the public. The buying urge was absent; orders were withheld pending election results. As a consequence stocks of mill supplies have become extremely low. A convincing proof of this condition was the oft-repeated complaint recently heard in dyestuff circles to the effect that few orders were being received. Now all that is past. Textile mills certainly cannot produce without ample supplies of dyes and chemicals. They are receiving daily a rapidly increasing number of orders, and just as rapidly consuming their stocks of supplies.

The dye manufacturer must place himself in the present mental attitude of the mill buyer. He can then realize that textile mills are striving ambitiously to recover the markets they lost duriug the period of severe depression through which the industry just passed. These mills are urged by an intense desire to save money, to increase capital, to produce better merchandise, to excel competitors. They will work out many new plans and introduce new lines of goods. It follows, therefore, that the mill buyer is at present unusually receptive to new ideas, new services and new products. In other words, he has, by a kind of psychological revolution, discarded his habitual reserve and has become a "ripe" prospect, willingly attentive to the propositions offered by the various manufacturers who supply his mill.

While the mill buyer is in this attitude he is very likely to place orders with some manufacturers that have never before been favored with his business. He will remember, perhaps, some dissatisfaction resulting from the use of some particular manufacturer's colors or chemicals, and is thus more easily impressed with the attractive propositions of other manufacturers.

This practice of shifting orders from one manufacturer to another should, at this particular time, be a controlling factor in the dyestuff manufacturer's selling campaign. From now until the spring of the year should be a very profitable period to every dyestuff manufacturer. He should change his passive "order taking" posture and make a tremendous drive to bring his product or service to the attention of every prospect on his list. Now is the time for him to direct a campaign against those aloof, impregnable prospects, those "unconvincibles" that cause much of the profanity in salesmanship.

Although this selling attack can be made suddenly, it should be very carefully planned. To be effective, to be genuinely successful, such a campaign should have back of it the fruits of years of selling experience in the dyestuff market. Every facility, every medium for bringing the product or service of the manufacturer before the mill buyer should be utilized to the utmost. Let not the right wing of the campaign be weaker than the left. Let the onslaught be forcefully directed from every possible angle. Instruct salesmen in more effective methods. Equip them with adequate sales literature. Plan an extensive mail campaign, and carefully consider the trade journals in the field as powerful media for the selling message.

The foremost factor in any selling campaign is the spirit of the manufacturer. He must first become enthusiastic and wide awake to the vast possibilities and profitable results of a broad advertising campaign instituted at this time. Let this spirit direct the planning of new sample cards, circulars, announcements, sales letters. Let this enthusiasm work in close co-operation with intelligent salesmanship in the planning of impressive magazine advertising designed to support the direct mail pieces and to prepare the mill buyer for the salesman by introducing the manufacturer's name and product or service to every possible prospect.

The cost of a campaign is the one consideration which the dyestuff manufacturer must face heroically. Perhaps he may decide to plan his campaign on a budget basis. At all events any timidity regarding expense should never be allowed to take a controlling part in the actual planning of the campaign. Could the manufacturer fully comprehend the *purpose* of his campaign he would not

be timid. Could he but convince himself that he now has one of the greatest opportunities of his business career to expand his markets, to increase the number of his customers, to boost his sales, he would not let the thought of preliminary expense pervert his plans. Could he but realize that by expending a small sum NOW on the selling division of his business he would very soon regain ten times that initial expense when his campaign was fully under way, he would quickly develop the enthusiasm necessary for the success of that campaign.

The manufacturer who says that he doesn't believe in advertising because his customers know where he is and know what he sells will probably have the doubtful satisfaction of noticing some slight increase in his business during the coming months. He will probably receive several new orders from some mill that determined to change its source of supply, and for some vague reason choose him to be the recipient of its orders. But that dyestuff manufacturer is usually too stupid to imagine how great his business might have increased if he had had the enthusiasm and the knowledge of modern business methods to launch an effective advertising campaign, too prejudiced against advertising to speculate upon what the results would have been had he made some intelligent efforts to bring his products or service to the attention of the hundreds of mills that are now beginning to restock their shelves.

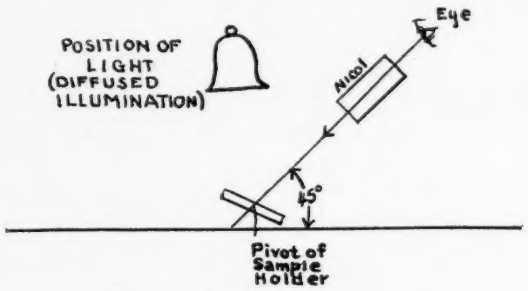
CORRESPONDENCE

American Dyestuff Reporter,
New York City.

Gentlemen:—I was very much interested in Walter C. Durfee's article, "Seeing Colors Through a Nicol Prism," in The Reporter of September 8th. It occurs to me that both you and he might be interested in some further data on this very practical subject, as well as some experiences I have had with the use of Nicol prisms in practical application to textile problems.

At the outset I might say that one reason which may react rather seriously against their more general employment in textile work is that the supply of calc-spar from which they are made is somewhat limited in amount and is pretty well controlled by a few large houses. However, this does not prevent there being sufficient volume of this material for use in the special optical and colorimetric instruments to which it is a vital necessity. It is rather necessary that crystals be large enough to give a free field of view through the made-up prism of about three-eighths inches in diameter, this for the sake of giving a sufficiently large field of observation of samples. Indeed, in certain classes of work, it would be extremely advantageous to have the field of view considerably larger than three-eighth inches.

At the color laboratory of Cheney Brothers we had two Nicols made which gave approximately one inch free view. These were very fine pieces of work, made by the optical shop of the late John Brashear, in Pittsburgh, and proved to be adequate to the wide variety of applications in which we used them.

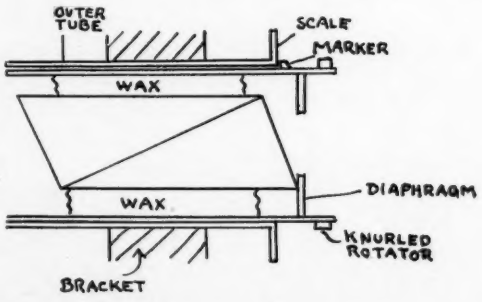


ARRANGEMENT

Halle, in Hamburg, Germany, and the famous optical house of Adam Hilger, London, England, control by far the greater proportion of the world's present supply of larger crystals. Several instrument houses in America import both unmounted and mounted crystals in various forms, most of them small, however, but Bausch & Lomb, Rochester and New York, carry in stock very satisfactory ones, beautifully mounted and precise in all respects. A few scattered optical shops in America have some on hand and some laboratories have wonderful specimens. One research laboratory that I know of has one with a field of view of about two and one-half inches—larger than necessary for practical industrial purposes, but at the same time a remarkable asset to pure science investigation. If you try to get almost any optical shop to make up the prisms for you from the rough blocks they will refuse, as it is a very trying piece of work involving special set-up and technique, with more than fair chances of failure, if one only is done.

Costs vary somewhat in the mounted prisms, running from twenty dollars for cheaper types to fifty and seventy-five dollars for excellent types.

It may be well to mention certain precautions which should be taken in the care, preservation and use of these prisms. Made as they are of two pieces of the calc-spar placed integrally together on two highly-polished faces and set in a mounting of wax or the like, it is wise to



SECTION VIEW OF MOUNTING

handle them carefully in order that they do not become chipped, cracked or degraded in the power to do their work by being dislodged from their carefully-adjusted setting. Therefore, in times when not being used they should be stored in a cushion-lined case, and when mounted it is necessary to see that the clasp of the mounting does not jam them anywhere.

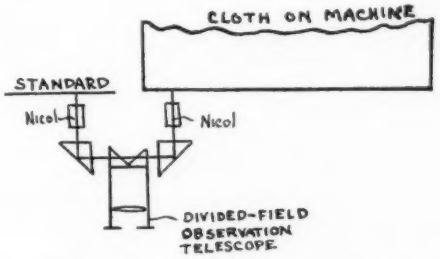
The best form of mounting for general use is as follows: The prism to be set firmly in a hard wax and this firmly imbedded in a tube that fits (sliding fit) within a slightly larger tube. A reference point is made on one tube and a scale engraved on the other, in degrees, so that the degree of rotation of the prism with respect to the support (which is fastened to the outer tube) may be read off. For most practical cases it is best to point the line of sight of the Nicol at 45 deg. to a level and make such a support for the tubes as will keep it at this angle. Then provide a *sample* holder that will turn about an axis in the line of sight of the Nicol (see sketch) so that light can be directed upon the sample at any rate; also the sample can be observed through the Nicol at various angles. The reason for this arrangement is that certain conditions of surface can be read best at specific angles, depending upon whether color properties are to be studied or mechanical (fiber) conditions. This will also vary somewhat with the various cloth textures. A further advantage of this position is prevention of shadow, from the observer's head, upon the sample, and the facility it gives of allowing a wide range of types of illumination. In order to get sharpest results, especially with dark colors, it is necessary to have the tube holding the Nicol extend beyond it somewhat so that when the eye is applied to the eyepiece a completely dark field joins eye and Nicol.

Light observed through a Nicol is, of course, somewhat lowered in intensity, and for this reason the best possible illumination should be used in this work, in spectral quality as well as power. The best form encountered is a daylight lamp of the ray-filter type in which the radiation produced is equivalent to north sky illumination. This light can be used in diffused form or directed with a condensing apparatus so that a pencil beam of parallel rays is directed upon the sample holder. A device is marketed by one of the optical companies for doing this.

In the paper, "How the Increased Demand for Art in Textiles Affects Color-Process Departments," in the July 14th issue of THE REPORTER, I mentioned an instrument, the "Glarimeter," which is, in effect, an elaboration of the Nicol prism set up for measuring the amount of sheen upon a surface. The arrangement is about that described above and the revolution of the Nicol or similar prism determines the amount of sheen.

Revolution of a single Nicol through its effective arc extinguishes all sheen; revolution of two Nicols, placed end to end, cuts out all light and may be used, therefore, as a measure of light intensity over the whole scale between maximum light and darkness. This latter arrangement has several valuable applications. Perhaps the most noteworthy of which is its use in a certain combination of optical elements (quartz plates, etc.), to establish the equivalent in color, and intensity of relative spectral distribution, of natural daylight. Most spectrophotometers, a brightness photometer (the Martens polarization photometer), many special types of colorimeters with spectroscope basis, etc., carry the Nicol prism as a means to adjust brightness of two fields of comparative observation of sample and standard or else for the purpose of eliminating this sheen element in color measurements. It is a standard element for this class of work in such instruments.

I have found the Nicols, used alone in pair and with certain special auxiliary optical pieces like color filters,



PRINT INSPECTION

of very great usefulness in practical textile work. A few examples will illustrate:

1. A large contract for printed goods, all of which was to be used on a single piece of wall covering which would bring out in glaring relief even slight degrees of change in the background color, showed a tendency to vary slightly in this background color under certain conditions of the print run. This was so gradual in approach as to be difficult of detection until a marked change had come about. The shiny nature of the fabric made detection of the color change particularly difficult. Inspection was set up in the print process and readings taken at intervals of every twenty yards of cloth run, whereupon the appearance of the color, seen through the Nicol, afforded instant detection of the change.

2. A heavy pile fabric showed streaks against its dark surface that resulted in a great amount of the material being diverted to seconds. The belief that these streaks were a result of stains led to expensive and extensive investigation of the dyeing process, without correction of the evil. A principle employed by the Allied navies for detection of submarines was brought into play and with this, aided by a system of inspection of the goods under various conditions, it was established that the streaks were caused by breakdown of the fibers which made up the pile fabric, causing irregular refraction of light through them in the cloth, and this presented an appearance of a color streak.

3. Satins, in gray goods, were graded by means of setting tolerance limits, within which the sheen for each

type of satin should run. Grading, in successive stages, was done within each of these tolerance groups, providing far more uniform results than possible with casual eye inspection.

4. A similar application was made in the case of white cloth, the degree of white being measured more accurately as an independent factor when measured through a Nicol than in any other way. Due to various conditions of calender finish the slight differences in sheen made grading of whiteness alone a very confusing matter without this aid.

5. Several fine-matching problems were solved by making the adjustment and carrying out the check-inspection work aided by Nicols:

High-luster goods were brought into better and more uniform color adjustment with a graded scale of shades advertised.

Upholstery yarn for special orders was graded and tabulated for later production under an "exact match" guarantee.

Dyed reproduction of certain threads and patches necessary to the repair of a very particular upholstery job was accomplished by virtue of the elimination of confusing elements of lighting and aging that were present on the job, resulting in very satisfactory reproductions which fulfilled the appearance specifications.

The above are some of the experiences with and practical features of work with Nicol prisms. A textile laboratory concerned with fine-quality production can find examples of great benefit from their use, increasing in number as facility with their technique is acquired.

Yours very truly,

(Signed) HIBBARD S. BUSBY.

THE PENETROMETER AND ITS IMPORTANCE IN DETERMINING THE WATER RESISTANCE OF FABRICS

(*Concluded from page* 783)

trometer, it is found that the results are closely related to the size of the opening through which the water flows. But it is very difficult to make apparatus of this sort with openings which are perfectly alike in all cases, with the result that different values are obtained with different testers.

The conclusion is reached that the instrument first described possesses intrinsic advantages which recommend it for use in preference to all other types now commonly employed for this purpose.

FIRE SPARED ONYX CHEMICAL COMPANY

The two fireproof factories of the Onyx Oil & Chemical Company withstood the roaring flames around them in the recent disastrous fire in Jersey City. These factories, which adjoined the saltpeter plant destroyed with fourteen other buildings, were the only two that escaped destruction by the fire. The Onyx company plant was not damaged in any way and business was continued amid the ruins.

RECENT LITERATURE

Chemistry in Industry: A Co-operative Work Intended to Give Examples of the Contributions Made to Industry by Chemistry. Edited by H. E. Howe. The Chemical Foundation, Inc. 372 pages. 50 illustrations. Price $1.00.

"The chymists are a strange class of mortals impelled by an almost insane impulse to seek their pleasures among smoke and vapour, soot and flame, poisons and poverty; yet among all these evils I seem to live so sweetly that I may die if I would change places with the Persian king."

Thus, in 1669, wrote Johann Joachim Becher, the German phlogistonist. With this quotation as a frontispiece, "Chemistry in Industry" unfolds in twenty-one fascinating chapters written by twenty-one leading industrial chemists the wonderful story of the achievements of chemistry in its close relation to various American industries. The book is one of the most important non-technical expositions of industrial chemistry that have ever been compiled. Through it all runs the spirit of the chemist as expressed by Becher. It is the story, told from widely divergent angles, of how man controls the elements to produce his mighty works in every age, and particularly in this, our own age of science, research, discovery and invention.

The fact that such a book *ought* to become popular, ought to be used as a text-book in our schools and colleges, affirms more emphatically than ever before the ofttimes discouraging truth that the greater portion of mankind is sadly ignorant of the fundamental part which chemistry takes in the preservation and betterment of our lives. The mass of people nonchalantly accepts the contributions of science, as Arthur D. Little recently expressed it, "as the fish accepts the ocean."

Only through the medium of such a symposium as this "Chemistry in Industry," can the man on the street be properly told of the marvels that are being evolved around him while he works and sleeps, and is absorbed in his own circumscribed world of business and social activities. Only by presenting its story in a manner so direct and so forceful, in a style so simple, so concise, so intelligently entertaining and so absorbingly interesting, can the American chemical industry adequately impress upon the public mind the real facts about its relation to this country's industrial and economic advancement.

The inherent interest of this story of chemistry in industry, although seemingly scattered among more than a score of widely different fields of endeavor, is remarkably unified; the chapters are like hammer blows, backed by the force of example and following one upon the other, driving home a vivid, lasting impression of the keystone

position occupied in modern civilization by the combined branches of the chemical industry. It is plainly evident that each author fully understood the importance of his task, and with this realization before him each produced an educational masterpiece.

One by one these men present the little known story of the part that chemistry plays in the particular industry with which each is identified as an authority. The action of each story is laid in a different setting: now it is in the paper mill, now in the glass works, in the roaring iron and steel foundries, in the reeking leather tanneries and packing houses. But the genie of chemistry rises through the vapors from every retort and from every blast furnace, from every bubbling distillery and from every vat of boiling dye. This genie and his magic is everywhere: now in the form of an abrasive, now concealed in each of the myriad coal tar products and even within the tiny cotton seed; now bursting forth in a shower of brilliant hues and now exhaling delicate perfumes. With surprising versatility and unquenchable energy he projects his power first into a drop of that priceless liquid of transportation, gasoline, and then into a magic solution that brings out upon film the vision recorded by the camera's eye; now, with tremendous force, roaring to the skies and shifting huge mountains from their foundations to make way through the wilderness; then, in a quieter mood, waving his wand over the milky sap of the rubber tree and transforming it into a substance of a thousand uses. Even the very clothes we wear and the food we eat owe most of their finer qualities to the work of this same mighty force. Never a book of romance more real or more fascinating than this, the story of the living spirit of chemistry and its immeasurable work in industry, told by the men who direct its energies to work for them and for mankind.

These twenty-one authors labored under the direction of a highly competent editor, H. E. Howe of *Industrial and Engineering Chemistry*. The first chapter, "The Foundations of the Chemical Industry" is by Robert E. Rose," Director of the Technical Laboratory of E. I. du Pont de Nemours & Co. By entertaining simile and clear explanation he tells of the wonders of molecules and atoms, of acids and salts and electrons. The following chapters deal in turn with the uses of chemistry in twenty different industries. The story of chemistry in the textile industry, embracing the miraculous development of synthetic coal tar colors and bleaching and finishing agents, is told in the last sixteen pages by Professor Louis A. Olney of the Lowell Textile School, editor of the AMERICAN DYESTUFF REPORTER and president of the American Association of Textile Chemists and Colorists.

The Chemical Foundation, Inc., are the publishers of this book, which they have designated Volume I, evidently considering the very encouraging prospect of future additions. The primary purpose of this, the first volume, is to contribute to the greater success of the American Chemical Society Prize Essay Contest for 1925 and succeeding years. Undoubtedly it was with this in mind that the publishers set the price of the book so low as to be available to every student desiring to enter the contest. Even to look at the volume is a bibliophilic pleasure, for its neat black binding, gold-stamped cover, readable type and copious illustrations combine to make of it a handsome and extremely valuable addition to any library.

It is pertinent at this place to stress a thought that may easily be overlooked, namely, that the Chemical Foundation, in bringing out this volume, has taken a long, long stride forward in its efforts to disseminate worth-while literature of the chemical industry for the education of the American citizen.

Performance Tests of a Liquid Laundry Soap Used with Textile Materials. By F. R. McGowan, F. W. Smither and Charles W. Schoffstall. Department of Commerce, Bureau of Standards. 26 pages. 10 cents.

This brochure gives complete specifications and details of tests made by the Bureau of Standards for the purpose, to quote from an abstract on the first page, of comparing "the properties of a liquid laundry soap with other washing and scouring agents with respect to shrinkage in weight and dimensions, fading of dye, and changes in construction and feel. Tests were run on various textile materials, including knitted fabrics, wool fabrics, mohair yarns and wool fleeces. The laundry practice was both mild and severe to cover the range of usual practices in laundry operations. It was found that the liquid laundry soap was superior in each of the tests."

The apparatus used in the tests were two wooden laundry machines with a capacity of 3 to 10 pounds per operation. The kinds of washing and scouring agents used are enumerated and analyzed. Reference is made to the seven-hour test on wool cloth where it was desired to obtain information on the effect of repeated washing or long washing on the color of the material. Observations were made throughout these tests of the alkalinity of each washing.

Following these specifications the test procedure and results are described. The shrinkage in dimensions of cotton knit underwear, cotton knit underwear tubing, light-weight wool fabrics and wool blankets, the fastness of dyes to washing of light-weight wool fabrics, and the scouring of mohair yarns, wool top and Utah wool fleece are dealt with in turn, and a conclusion summarizes the total results of each test.

The booklet is illustrated with tables and charts presenting in statistical form the results of each test.

Three Textile Raw Materials and Their Manufacture. International Acceptance Bank, Inc., New York.

The International Acceptance Bank has performed a highly commendable piece of work in this booklet, and has performed it well. By issuing a book dealing

fundamentally and in non-technical language with one of the world's greatest industries, and in a general, comprehensive way with the branches, sub-divisions and various processes and commercial phases of that industry, this institution is making a new departure in the field of industrial education for the layman.

The intended scope and purpose of the work prohibited its authors from invading deeply the technical processes connected with textile manufacture. The book was designed to be a compact outline of the steps in the manufacture and marketing of cotton, wool and silk. But it is this very concise method of treating the subject that, in the opinion of a layman, lends an additional value to the book; that contributes something more to its interest and readability than was probably first intended.

Part I is concerned with cotton. The first chapter, entitled "The Raw Material," takes up in turn the cotton plant, its history, distribution and cultivation, grades and staples, buyers of raw cotton and the cotton exchanges. In "The Manufacture of Cotton" the reader is led through the history of the cotton industry's development in the United States and into the subjects of the actual making of the yarn, the processes involved, the weaving of gray goods, converting and finishing, and the knitting industry. The next chapter in this section explains the industrial organization of the cotton industry and the distribution of the products. A short concluding chapter shows by statistics and diagrams the past and present positions of the United States in the cotton industry.

The second part of the book deals in the same manner with wool, from sheep raising to worsted and woolen manufacture, with a chapter on the economic aspect of the industry. The chapters dealing with the manufacture of wool briefly describe all the processes involved—the scouring, carding, backwashing, combing, spinning, dyeing and finishing, and the making of yarn and cloth.

Part III presents the romantic story of silk. While the average person probably possesses a smattering of knowledge concerning the production of raw silk from the worm, the subsequent steps in its manufacture into cloth are understood only by those connected with the work itself. This section covers the entire subject in the same general, concise manner in which cotton and wool are dealt with, from the raw silk on through the reeling, the marketing and the manufacture of thrown and spun silk, to the final weaving and finishing operations, and includes a chapter on the much-discussed artificial silk industry.

The book is illustrated throughout with remarkably clear photographs of textile mill interiors and machinery; these pictures take the place of thousands of words of explanation, and their use greatly simplified the task of describing each of the processes involved in textile manufacture.

NEWPORT ISSUES THREE NEW BULLETINS

"The Dyeing of Anthrene Colors on Cotton, "Newport Colors for Dyeing Artificial Silks," and "The Carbonization of Wool Fabrics with Neomerpin-N" are the titles of three recent technical bulletin inserts which the Newport Chemical Works, Inc., has mailed to holders of their binder, distributed to the trade some months ago.

The first-named bulletin lists the Anthrene colors manufactured by the Newport Company and fully describes the dyeing processes for these colors in their application on cotton yarn, piece goods and raw stock, in various types of dyeing machines. Each method of dyeing is treated at length and dye bath formulas are given for the different colors. One section enumerates twelve important conditions to be observed in dyeing Anthrene colors; a method is given for obtaining white and colored resist effects with the Anthrene colors; a padding process is also described. In short, this booklet was designed to be a concise treatise on the use of Anthrene colors, and despite its briefness its contents embrace much information of a highly practical nature.

The bulletin on the dyeing of artificial silks lists the Newport colors most suitable for these fabrics, in some cases specifying their fastness properties, and gives complete information regarding the dyeing process and formulas used for dyeing the various types of artificial silk. The dyeing of Lustron and Celanese is dealt with, the dyeing methods for both being described clearly.

"The periodic occurrence of spots and streaks, unequal dyeing and damage to the wool fiber of carbonized goods," to quote from the bulletin on the carbonization of wool fabrics with Neomerpin-N," is very disagreeable and costly, and no dye plant seems to be able to eliminate this trouble entirely.

"The reasons for the occurrence of these spots and streaks, or the damaging and often destruction of the wool fiber is *always due to an accumulation of acid or, in some cases soda,* upon the places showing the spots or streaks. All other assumed reasons have been proven erroneous."

The reasons for this accumulation of acids are then given, and the remainder of this bulletin fully describes the use of Neomerpin-N in removing the causes.

These bulletins are of practical value to dyer and textile chemist and should be of great help in solving some of the problems met with daily in the dyehouse, and in eliminating much unnecessary work and trouble. Such information as these bulletins contain is not only presented in a clear, concise manner, but it is also authoritative. It is the sort of information that should be kept on hand for convenient reference; it is the sort of information that can be put to active use in the dyer's efforts to attain maximum efficiency and perfection.

Dunker & Perkins announce the removal of their offices on December 1 to 263 Summer Street, Boston. Their new telephone numbers are Liberty 5246 to 5248.

Practical Hints on the Production of Bright Colors on Textile Fabrics

Part VIII

Rolling of the Cloth—Rolling and Entering Mechanism—The Treating Plant—Operation of the Plant—Its Advantages

By RAFFAELE SANSONE

ONE of the most important operations in beam dyeing is the rolling of the pieces on the perforated cylinders on which they are to be treated. This operation has to be so conducted that while being wound regularly the different layers of cloth are not too tightly pressed one upon the other, or the material will not only become narrower but will also resist the passage of the different baths of treatment. The principle of a simple machine in employment for the purpose is indicated in Fig. 3.

This shows a strong wooden vat (V), having at its front a high entrance frame (A), also of wood, where the cloth is raised to a certain height from the ground, passing first on two upper opening bars (a), and then on two lower tension wooden bars (b), descending, after this, into the interior of vat V. Here it passes over seven guiding and tension rollers, passing from here above a large winding drum (R), against which is made to turn the perforated shaft on which the beginning of the cloth to be treated has been fixed by a long bar entering in an opening in the shaft. Here, by turning against drum R, a single or double roll of cloth is formed of any required diameter and with one or more pieces.

Another Plant

Another type of rolling or winding plant for cotton cloth, which has the great advantage of measuring the material, is indicated in Fig. 4.

This shows a light iron frame (F) having two measuring rollers (A and B), kept under a light pressure by a special disposition. A rod (c) is carried on frame F by two pivoted arms (d), and is connected by a link (e) with the long arm of a two-armed lever (f). The short arm of this lever is connected by a link (g) with an arm (h) fixed on a shaft (k), on which is fixed another arm (m), terminating in a fork (n) which engages the sliding member of the friction clutch C. This member is driven by a key on a shaft (a) which carries the bottom measuring roller (A) and is provided with a fast and loose pulley (b). The driven member of the clutch C transmits motion to a mandrel by a belt (o) which passes over the driven member of the clutch C and over a pulley (P) on a spindle, which forms a driving connection with the mandrel.

After the material (E) has passed between the measuring rollers (A and B) it is passed under the rod (c) and is then taken in an upward direction and passed over a roller (r) and under and over two tension rods (s and t), being attached to the mandrel, which may be made in two pieces placed side by side to grip the material and secured at their ends in two spindles. During the winding process, after the roll R has attained the same diameter as the measuring roller, it is continually attempting to gain on the latter, with the result that the pull exerted on the material keeps lifting the rod (c) and actuating the lever to allow the clutch members to slip sufficiently to cause the roll to travel at the same surface speed as that of the material where it passes between the measuring rollers.

Rolling and Entering Mechanism

In some dyehouses where the production of dyed cloth is carried out on a large scale, and where many small batches are dyed in different colors, a plant constructed on the principle shown in Fig. 5 would offer advantage.

This shows a high iron frame (K) having two heavy sides kept an equal distance apart by connecting rods and supporting a large central drum (H) having on both ends bearings for supporting six perforated beams in the positions indicated by A, B, C, D, E, and G. Drum H is alternately turned and stopped while the machine is working. When in the position indicated by E, the perforated beam is lowered out of the plant to pass in the position indicated by F, where it is taken up in a dye vat (V) running on rails, and can be moved to the portion of the works where it can be boiled out, dyed, bleached, soaped,

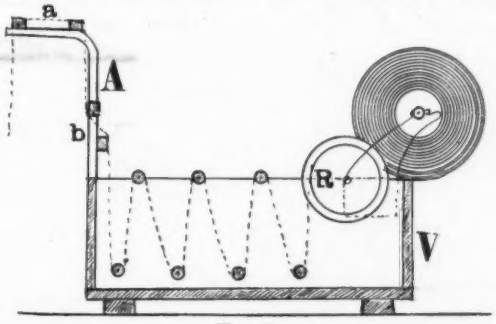


FIG. 3

etc., on a special treating plant. In position G a new empty perforated beam is entered from time to time by the operatives for replacing that making its way out at E.

At the top of the machine is a long projecting double arm (P) having five wooden opening and spreading bars, surmounted by copper plates with lines in two directions. On these is entered each piece in continuous form, the end of which is fixed to the empty perforated beam in the position indicated by A, to be wound and later moved into position B. Here it is pressed by an upper iron copper-lined bowl (J) and is delivered in position C, where an operative sews down rapidly the loose end of the piece to avoid its moving during the dyeing operations, and consequently the unwinding of the roll on the beam. While the first roll of cloth is passing through the machine another four beams have been filled with cloth, the filling then continuing as long as the dyeing, boiling out, bleaching, dyeing and soaping operations are continued.

The Treating Plant

The arrangement of the plant employed in the above instance for the treatment of the rolls, delivered one after the other in a separate small wagon vat, is quite special. It contains a series of junction tubes, connected with centrifugal pumps, that enter at one side of each small wagon in a short tube supporting one of the ends of the filled perforated beam, turning this and loading it with color pumped from a small pit with an inclined bottom, in which all bath falling out from the roll of cloth and from a tube at the bottom of the wagon vat collects. To keep the bath at the desired temperature it is heated before entering the core of the beam by the passage of the circulation tube, in the form of a spiral, in a cylinder of heated air.

Operation of the Plant

The work on the above plant would be as follows: One of the dyers enters piece after piece in the beam filling machine by joining the end of each piece to the beginning of the next to be entered and separating this as soon as the opening disposition F has been passed, with the assistance of a long pointed copper wire. The machine automatically moves the formed rolls and places them in the small wagon vat; this vat is pushed by the machine to slightly inclined rails that carry it past the treating plant to a point from which it can be switched to the desired department.

Here another dyer and a boy have prepared the first bath, and after having fixed the arrangement at the end of the vat to the tube leading to the circulation pump

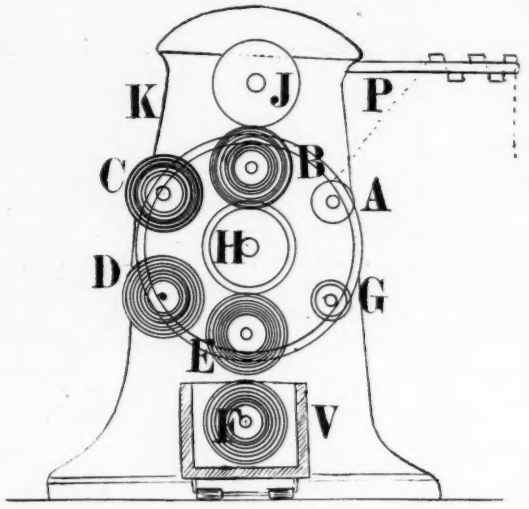


Fig. 5

they lower onto the vat a heavy copper or copper-plated cover, fastening this down quickly and entering the first dye bath. This is forced at a certain speed and at the required temperature through the material, and on falling into the wagon vat makes its way out through the delivery tube into the circulation trough or pit just below.

When in this way the first treatment has been completed, if a rinsing is to follow, this is conducted by causing the pump to force clean running water through the material, directing the issue waters to the waste water main by turning a joint and small tube at the end of the discharge tube on the bottom of the small wagon vat itself.

If other treatments are required when the above rinsing operations have been completed, these are made to follow by causing the respective baths, prepared in one of the empty preparation tanks, to circulate through the material; and after a second rinsing has been conducted, hot air warmed in a special apparatus at the back of the plant is pumped rapidly through the cotton cloth goods to dry these to the required degree. After this the small wagon vat is disconnected from the treating plant and is

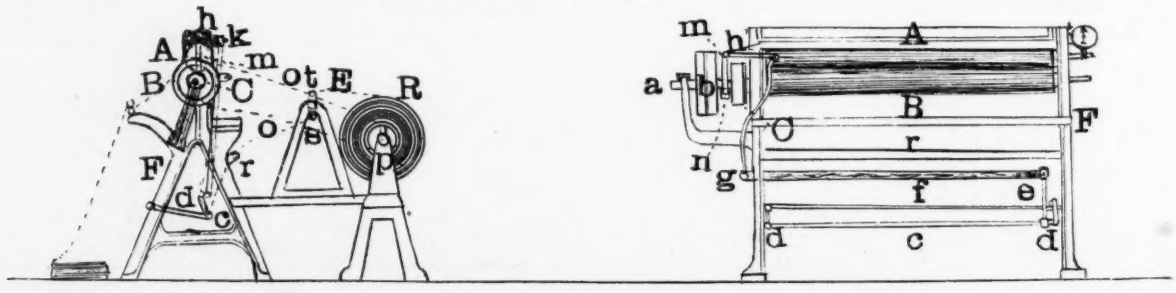


Fig. 4

sent on another pair of slightly slanting rails to the finishing compartment, where the perforated beam is placed at once before the finishing calender destined for its treatment, and can then be cold or hot pressed and packed ready for the client.

The Advantages of the Plant

Some of the advantages of the above plant can be indicated as follows:

1. With comparatively little employment of labor, beam after beam can be filled with cotton cloth and boiled out, bleached, dyed and soaped continuously, producing quite a large range of colors, with the same uniformity as on any other plant.

2. The amount of steam developed in the atmosphere is lower than with a plant of jiggers necessary for treating the same amount of material.

3. By using sufficiently large preparation cisterns the same dye bath can be prepared as will treat, one after the other, several rolls of cloth, producing exactly the same color, as the speed of the circulation, the amount of dye bath used and the heat can be maintained equal in all cases, while the amount of dye bath employed can be based on the weight of material present on each beam.

4. By using open delivery channels from the cisterns where the different baths of treatment are prepared to the pits already indicated, all cleaning operations can be conducted very speedily when changing the former.

5. When the same dye bath is employed for the treatment of several rolls of cloth, the quantity taken in each case can be regulated by a measuring clock placed after the delivery tap on the preparation cistern.

(*To be continued.*)

DYES IMPORTED DURING OCTOBER

(*Continued from page* 786)

Schultz No.	Name of Dye and Manufacturer	Quantity (pounds)
673	Azo Carmine B	826
	Azo Carmine B Extra—(B)	
	Rosinduline 2B Bluish—(K)	
681	New Fast Gray	661
	Malta Gray J—(P)	
685	Tannin Heliotrope—(C)	100
687	Rosolane	500
	Methylene Heliotrope Extra—(M)	
690	Metaphenylene Blue R	500
	Diphene Blue R—(A)	
695	Paraphenylene Violet	500
	Diphene Blue B—(A)	
700	Nigrosine (soluble in water)	200
	*Nigrosine T—(B)	
705	Indamine 6R	1,500
	Indocyanine B—(A)	
724	Immedial Black	810
	†Immedial Direct Blue B—(C)	
725	Immedial Brown	220
	*Immedial Brown RR—(C)	
733	Immedial Indone	1,950
	†Immedial Indogene GCL—(C)	
746	Katigene Green	50
	*Immedial Green GG Extra—(C)	
748	Hydron Blue (sgle. stngth.)	18
	†Hydron Blue G Powder—(C)	
754	Kryogene Direct Blue 3B	300
	Kurgan Violet 3RX—(B)	
759	Anthraflavone G (sgle. stngth.)	5,798
	*Anthra Yellow GC Paste—(B)	
	*Anthra Yellow GC Powder—(B)	
	Anthraflavone GC Powder—(B)	
	Helindone Yellow AGC Paste—(M)	
760	Indan. Golden Orange G (sgle. stngth.)	17,035
	Helindone Golden Orange 1C Paste—(M)	
	Helindone Golden Orange IG Double Paste—(M)	
	Vat Golden Orange G Dbl. Pst.—(B)	
	*Vat Golden Orange G Powder—(B)	
761	Indan. Golden Orange R (sgle. stngth.)	33,019
	Helindone Golden Orange IRRT Paste—(M)	
	Indan. Golden Orange RRT Pst.—(B)	
	*Indan. Golden Orange RRT Pdr.—(B)	
	Vat Golden Orange RRT Paste—(B)	
	*Vat Golden Orange Double Paste—(B)	
	*Vat Orange RRT Paste—(B)	
	*Vat Orange RRT Paste—(By)	
	Vat Orange RRT Paste Fine—(B)	
	*Vat Golden Orange RRT Powder—(B)	
762	Indan. Scarlet G	310
	Indan. Scarlet GS Powder—(B)	
	Vat Orange 4R Powder—(B)	
765	Indan. Green B (sgle. stngth.)	5,164
	Indan. Blue Green B Dbl. Pst.—(B)	
	Vat Black BB Dbl. Pst.—(B)	
767	Indan. Violet RR (sgle. stngth.)	2,605
	Vat Brilliant Violet RR Pst. Fine—(B)	
	Vat Brilliant Violet RR Powder—(B)	
	Vat Violet RR Ex. Dbl. Pst.—(B)	
778	Alizarine, Synthetic	12,940
	†Alizarine VI Extra Pure—(B)	
	Alizarine Red DIB New Paste—(Q)	
779	Alizarine Orange	5,093
	Alizarine Orange AO—(BA)	
	Alizarine Orange RP Paste—(By)	
780	Alizarine Red	606
	†Alizarine Carmine—(Q)	
	Alizarine Red W Powder—(By)	
784	Alizarine SX, GD	2,176
	Alizarine SX Paste—(B)	
785	Alizarine RG, GI	2,272
	Alizarine Red YCA—(BA)	

Schultz No.	Name of Dye and Manufacturer	Quantity (pounds)
787	Alizarine Bordeaux B	100
	Alizarine Bordeaux BP Paste—(By)	
790	Acid Alizarine Blue BB, GR	300
	Anthracene Blue SWGG Powder—(B)	
794	Cibanone Black (sgle. stngth.)	1,904
	Cibanone Black 2G Powder—(I)	
795	Cibanone Yellow R Paste—(I)	551
797	Alizarine Garnet	500
	Alizarine Claret R Paste—(M)	
800	Anthracene Blue D	829
	Anthracene Blue WB Paste—(B)	
	Anthracene Blue WG Paste—(B)	
804	Alizarine Blue S	1,605
	*Alizarine Blue S Powder—(By)	
	*Alizarine Blue SB Powder—(M)	
811	Algol Yellow 3G (sgle. stngth.)	128
	Algol Yellow 3G Powder—(By)	
	Vat Yellow 5G Paste—(Gr-E)	
815	Algol Scarlet G (sgle. stngth.)	16
	Algol Scarlet G Powder—(By)	
816	Algol Red 5G (sgle. stngth.)	800
	*Vat Red 5GK Powder—(By)	
817	Algol Yellow R (sgle. stngth.)	513
	*Vat Yellow GK Paste—(By)	
	Vat Yellow GK Powder—(B)	
	Vat Yellow GK Powder—(By)	
819	Algol Red FF, R (sgle. stngth.)	3,535
	Algol Brilliant Red 2B Powder—(By)	
	*Algol Red FF Extra Paste—(By)	
	Vat Brilliant Red 2B Powder—(By)	
	*Vat Red FF Extra Powder—(B)	
820	Algol Brilliant R (sgle. stngth.)	100
	Vat Brilliant Violet RK Powder—(B)	
821	Algol Brilliant Violet R (sgle stngth.)	832
	Algol Blue 3R Powder—(By)	
	Algol Bue 3RP Powder—(By)	
	Vat Brilliant Violet BB KPowder—(B)	
822	Algol Brilliant Orange FR (sgle. stngth.)	400
	Vat Orange RRK Powder—(B)	
824	Algol Orange R (sgle. stngth.)	16
	Vat Orange 6RTK Powder—(By)	
827	Indan. Bordeaux B Ex. (sgle. stngth.)	2,040
	Anthra Bordeaux R Powder—(B)	
	Anthra Claret R Paste—(B)	
	Vat Bordeaux B Extra—(B)	
830	Indan. Red R (sgle. stngth.)	2,520
	Anthra Red RT Paste—(B)	
	*Vat Red R Extra Powder—(B)	
831	Indan. Red BN (sgle. stngth.)	8,041
	Indan. Red BN Ex. Paste—(B)	
	Vat Red BN Paste—(B)	
	*Vat Red RK Paste—(B)	
	*Vat Red RK Powder—(B)	
832	Indan. Violet RN (sgle. stngth.)	8,223
	Indan. Violet BN Powder—(B)	
	*Vat Violet BN Paste—(B)	
	Vat Violet BN Paste Fine—(B)	
	Vat Violet BN Extra Paste—(B)	
	Vat Violet BN Powder—(B)	
833	Algol Olive (sgle. stngth.)	2,410
	Vat Olive R Paste—(By)	
	Vat Olive R Powder—(By)	
834	Algol Gray (sgle. stngth.)	432
	Vat Gray GK Paste—(By)	
	Vat Gray GK Powder—(By)	
	Vat Gray K Powder—(By)	
838	Indan. Blue RS (sgle. stngth.)	1,740
	Vat Blue RS Double Paste—(B)	
	Vat Blue RS Triple Powder—(B)	
839	Algol Blue K (sgle. stngth.)	16
	Vat Blue RK Powder—(By)	
841	Indan. Blue GGS (sgle. stngth.)	3,786
	Vat Blue GGSP Double Paste—(B)	
	Vt Blue GGS† Double Paste—(B)	
842	Indan. Blue GCD (sgle. stngth.)	10,480
	Helindone Blue IGCD Dbl. Pst.—(M)	
	Indan. Blue GCD Dbl. Pst.—(B)	
843	Indan. Blue GC:	
	Cibanone Blue G Powder—(I)	110
	Vat Blue GC Double Paste (sgle. stngth.)—(By)	1,000
844	Algol Blue 3G (sgle. stngth.)	5,658
	Vat Blue 3G Paste—(B)	
	Vat Blue 3G Paste Fine—(B)	
	*Vat Blue 5G Paste—(By)	
	*Vat Blue 5G Powder—(B)	
	Vat Blue 5G Powder—(By)	
849	Indan. Yellow (sgle. stngth.)	8,703
	Helindone Yellow IG Dbl. Pst.—(M)	
	Indan. Yellow G Dbl. Pst.—(B)	
	Vat Yellow G Dbl. Pst.—(B)	
	Vat Yellow G Dbl. Pst. Fine—(B)	
	Vat Yellow GP Paste—(B)	
	Vat Yellow GT Paste—(B)	
851	Alizarine Direct Blue B—(M)	200
852	Alizarine Irisol D, R	610
	Alizarine Direct Violet R—(M)	
	Alizarine Irisol R Powder—(By)	
	*Alizarine Blue JR—(By)	
853	Anthraquinone Violet	597
	Anthraquinone Violet Powder—(B)	
	*Anthraquinone Violet Powder—(By)	
854	Alizarine Viridine FF Paste—(By)	1,279
855	Alizarine Pure Blue	2,310
	Alizarine Blue SKY—(By)	
	*Alizarine Sky Blue B Powder—(By)	
856	Alizarine Astrol	2,761
	*Alizarine Astrol B Powder—(By)	
	*Alizarine Blue AS Powder—(By)	
858	Alizarine Saphirol B	12,802
	†Alizarine Light Blue B—(S)	
	†Alizarine Light Blue SE—(S)	

Schultz No.	Name of Dye and Manufacturer	Quantity (pounds)
	Alizarine Blue SAWSA—(By)	
	Alizarine Saphirol WSA—(B)	
	†Alizarine Saphirol WSA—(By)	
860	Cyananthrol G	1,543
	Alizarine Direct Blue BGAOO—(B)	
861	*Anthraquinone Blue SR Extra—(By)	55
862	Alizarine Blue Black	12,986
	†Alizarine Blue Black B Powder—(By)	
	Alizarine Blue Black B Powder—(M)	
	†Alizarine Blue Black 3B Powder—(By)	
864	*Anthraquinone Green GXNO—(B)	375
865	Alizarine Direct Green G	531
	Alizarine Brilliant Green G—(C)	
	†Alizarine Cyanine Green G—(By)	
867	Indan. Brown B Paste	440
	Anthra Brown B Paste—(B)	
868	Cibanone Brown B (sgle. stngth.)	721
	Cibanone Brown B Paste—(I)	
	Cibanone Brown B Powder—(I)	
869	Algol Brown B (sgle. stngth.)	9,408
	Helindone Brown IR Paste—(M)	
	*Vat Brown R Paste—(By)	
	*Vat Brown R Powder—(By)	
870	Algol Corinth R	1,610
	*Vat Corinth RK Paste—(By)	
	Vat Corinth RK Powder—(B)	
	Vat Corinth RK Powder—(By)	
871	Indan. Red Violet RRN (sgle. stngth.)	1,338
	Vat Red Violet RRK Paste—(B)	
	Vat Red Violet RRK Powder—(B)	
	Vat Red Violet RRK Paste Fine—(B)	
876	Indigo, White	231
	Indigosol—(By)	
	Indigosol O—(DH)	
881	Ciba Blue 2B (sgle. stngth.)	1,581
	Brilliant Indigo 4B Powder—(B)	
	Brom Indigo FB Powder—(By)	
	Brom Indigo FBP Powder—(By)	
	Indigo MLB/4B Powder—(M)	
	Brom Indigo FBP Paste—(By)	
883	Indigo KG (sgle. stngth.)	500
	Indigo MLB/6B Powder—(M)	
885	Brilliant Indigo BD	2,236
	*Brilliant Indigo B Paste—(B)	
893	Alizarine Indigo G (sgle. stngth.)	13
	Alizarine Indigo G Paste—(By)	
	Alizarine Indigo G Powder—(By)	
894	Alizarine Indigo B	420
	Alizarine Indigo B Powder—(By)	
	Alizarine Indigo Green B Paste—(By)	
	Alizarine Indigo Green B Pdr.—(By)	
695	Alizarine Indigo 3R (sgle. stngth.)	429
	*Alizarine Indigo 3R Paste—(By)	
	Alizarine Indigo 3R Powder—(By)	
897	Ciba Heliotrope B (sgle. stngth.)	3,851
	Ciba Heliotrope B Paste—(I)	
	Ciba Heliotrope B Powder—(I)	
899	Ciba Gray (sgle. stngth.)	550
	Ciba Gray B Powder—(I)	
901	Ciba Violet B (sgle. stngth.)	12,233
	Ciba Violet B Paste—(I)	
	Ciba Violet B Powder—(I)	
	Ciba Violet R Paste—(I)	
906	Ciba Red G (sgle. stngth.)	1,100
	Ciba Red G Powder—(I)	
907	Ciba Scarlet (sgle. stngth.)	5,179
	Ciba Scarlet G Extra Paste—(I)	
	Thioindigo Scarlet 2G Paste—(K)	
907	Helindone Fast Scarlet G Paste—(M)	1,000
908	Ciba Red R Paste—(I)	2,204
910	Helindone Pink Paste	4,500
	Anthra Pink AN Paste—(B)	
	Anthra Pink BN Paste—(B)	
	Helindone Pink AN Paste—(M)	
	Helindone Pink BN Paste—(M)	
911	Ciba Orange G Paste—(I)	551
912	Thioindigo Red B Paste—(K)	255
918	Helindone Red 3B (sgle. stngth.)	3,187
	Helindone Red 3 BPaste—(M)	
	Helindone Red 3B Powder—(M)	
	Thioindigo Red 3B Paste—(K)	
	Vat Red Violet RH—(B)	
919	Ciba Bordeaux B Paste—(I)	331
920	Helindone Violet (sgle. stngth.)	250
	Helindone Violet R Powder—(M)	
923	Ursol	480
	*Fur Brown NZ—(A)	
	Fur Gray ALA—(A)	
	*Fur Gray B—(A)	
	Fur Yellow 4G—(A)	
	Nako Gray B—(A)	

UNIDENTIFIED DYES

Acid Dyes

Name of Dye and Manufacturer	Quantity (pounds)
Acid Milling Red R Conc.—(G)	441
Acid Violet 10B—(C)	5
Alizarine Direct Blue A—(M)	200
Alizarine Direct Violet E2B—(M)	500
Alizarine Leveling Blue B—(C)	1,000
Alizarine Rubinol	952
Alizarine Rubinol 3G Powder—(By)	
*Alizarine Rubinol GW Powder—(By)	
*Alizarine Rubinol R Powder—(By)	
Azo Orseille 3B—(C)	5
*Brilliant Milling Blue B—(C)	5,110
Brilliant Milling Red R—(C)	500
*Brilliant Pure Yellow 6 Extra—(By)	441
Cloth Fast Yellow G—(I)	882
*Erio Fast Fuchsine BBL—(G)	441
*Fast Light Red BL—(By)	885
Fast Sulphon Green 8G Conc.—(S)	2,204

Name of Dye and Manufacturer	Quantity (pounds)
Guinea Fast Red	2,000
Guinea Fast Red BL—(A)	
Guinea Fast Red 2BL—(A)	
Guinea Fast Red 2R	
Kiton Fast Red 4BL—(I)	110
Polar Orange R Conc.—(G)	1,102
*Radio Yellow R—(C)	540
†Silk Blue BT5B Extra Conc.—(Gr-E)	250
*Supramine Bordeaux B—(By)	286
*Supramine Green G—(By)	419
*Supramine Red B—(By)	221
Supramine Yellow G—(By)	201
*Wool Fast Blue BL—(By)	551
Wool Fast Yellow G—(B)	330
*Xylene Milling Blue AE Conc.—(S)	500
*Xylene Milling Red B Conc.—(S)	1,000

Vat Dyes

Algol Black CL Powder (sgle. stngth.)—(By)	16
Algol Black RO Powder (sgle. stngth.)—(By)	16
Algol Blue FB Powder (sgle. stngth.)—(By)	16
Algol Brilliant Pink FB Powder—(By)	2
Algol Brilliant Pink FF Powder—(By)	2
Algol Brown (sgle. stngth.)	2,800
Vat Brown G Paste—(By)	
Vat Brown G Powder—(By)	
Algol Green (sgle. stngth.)	413
*Vat Green BB Paste—(By)	
Vat Green BB Powder—(By)	
Alizarine Indigo 5R Powder—(By)	2
Alizarine Indigo 7G Powder—(By)	2
Alizarine Indigo Black B Powder—(By)	2
*Alizarine Indigo Brown R Paste—(By)	1,776
Alizarine Indigo Gray B (sgle. stngth.)	15
Alizarine Indigo Gray B Paste—(By)	
Alizarine Indigo Gray B Powder—(By)	
Alizarine Indigo Red B (sgle. stngth.)	15
Alizarine Indigo Red B Paste—(By)	
Alizarine Indigo Red B Powder—(By)	
Alizarine Indigo Violet B (sgle. stngth.)	15
Alizarine Indigo Violet B Paste—(By)	
Alizarine Indigo Violet B Powder—(By)	
Ciba Pink BG (sgle. stngth.)	1,650
Ciba Pink BG Powder—(I)	
Ciba Printing Black B Paste—(I)	1,102
Cibanone Blue 2G Powder—(I)	110
Cibanone Red G Powder—(I)	110
Grelanone Orange RB Paste—(Gr-E)	112
Grelanone Red 2B Paste—(Gr-E)	56
Grelanone Scarlet G Paste—(Gr-E)	56
Grelanone Violet 3B Paste—(Gr-E)	56
Helindone Printing Black RD Paste—(M)	200
Helindone Yellow IRK—(M)	500
*Hydron Brown D Vat—(C)	5
Hydron Brown (sgle. stngth.)	15,266
*Hydron Brown G Paste—(C)	
*Hydron Brown G Powder—(C)	
*Hydron Brown R Paste—(C)	
*Hydron Brown R Powder—(C)	
*Hydron Green G Paste—(C)	900
Hydron Orange (sgle. stngth.)	19,080
*Hydron Orange R Paste—(C)	
*Hydron Orange RF Paste—(C)	
*Hydron Orange RF Powder—(C)	
Hydron Pink (sgle. stngth.)	27,498
*Hydron Pink FB Paste—(C)	
†Hydron Pink FF Paste—(C)	
*Hydron Pink FF Powder—(C)	
Hydron Scarlet (sgle. stngth.)	5,780
*Hydron Scarlet BB Paste—(C)	
*Hydron Scarlet BB Powder—(C)	
*Hydron Scarlet 3B Paste—(C)	
*Hydron Scarlet 3B Powder—(C)	
Hydron Sky Blue FK Paste—(C)	900
*Hydron Wool Brown G Vat—(C)	5
*Hydron Wool Olive B Vat—(C)	5
*Hydron Wool Olive BB Vat—(C)	5
*Hydron Wool Yellow G Vat—(C)	5
†Hydron Yellow NF Paste—(C)	1,300
Indan. Black BGA (sgle. stngth.)—(B)	200
Indan. Blue BCD (sgle. stngth.)	488
Vat Blue BCD Dbl. Pst.—(B)	
Indan. Blue BCS (sgle. stngth.)	19,605
Vat Blue BCS Powder—(B)	
Indan. Brilliant Blue R (sgle. stngth.)	400
Vat Brilliant Blue R Powder—(B)	
Indan. Brown (sgle. stngth.)	3,348
Helindone Brown IG Paste—(M)	
Helindone Brown IG Powder—(M)	
*Vat Brown G Paste—(B)	
Helindone Brown IR Powder—(M)	
Vat Brown RT Paste—(B)	
Vat Brown 3R Paste—(B)	
Indan. Green BB Powder—(B)	100
Indan. Green (sgle. stngth.)	1,300
Vat Green G Double Paste—(B)	
Vat Green GG Double Paste—(B)	
Indan. Olive R Paste—(M)	500
Indan. Pink (sgle. stngth.)	10,403
*Anthra Pink B Extra Paste—(B)	
Anthra Pink R Extra Paste—(B)	
Vat Pink B Double Paste—(B)	
Vat Rose B Extra Paste—(B)	
Helindone Pink IB Powder—(M)	
Thioindigo Rose RN Extra Paste—(K)	434
Vat Orange 3R Paste—(B)	2,305
Vat Red GG (sgle. stngth.)	2,149
Vat Red GG Paste—(B)	
Vat Red GG Paste Fine—(B)	
Vat Red GG Powder—(B)	
Vat Yellow 6G, 6GD Powder—(A)	10

Name of Dye and Manufacturer	Quantity (pounds)
Mordant and Chrome Dyes	
†Acid Alizarine Blue Black R Conc.—(M)	10
Acid Alizarine Gray G—(M)	500
*Alizarine Fast Blue BHG—(By)	116
*Alizarine Fast Gray 2BL Powder—(By)	935
†Anthracene Chromate Brown EB—(C)	7,550
*Anthracene Chrome Blue R—(C)	50
*Anthracene Chrome Brown DWN—(C)	10
Chrome Fast Blue FB—(A)	100
Chrome Fast Phosphine R—(DH)	110
Chrome Printing Red Y—(DH)	440
Chrome Sky Blue B Powder—(By)	561
Chromazurine G, DN—(DH)	330
Chromocitronine 3R—(DH)	110
Chromorhodine	770
Chromorhodine BN—(DH)	
Chromorhodine BR—(DH)	
*Chromorhodine 6GN Extra—(DH)	
Chromoxane Brilliant Blue G—(By)	10
*Eriochrome Green L—(G)	550
Eriochrome Red G—(G)	551
*Metachrome Blue Black 2BX—(A)	2,356
Metachrome Green G—(A)	50
Metachrome Olive Brown G Powder—(Bro.)	1,000
Metachrome Red G—(A)	100
Metachrome Violet B, 2R—(A)	600
Modern Gray RCN—(DH)	110
*Monochrome Brown BX—(By)	110
*Omega Chrome Brown G Conc.—(S)	663
*Ultra Corinth B—(S)	200
*Ultra Cyanol B Conc.—(C)	800
Direct Dyes	
*Azonine B, G, R, RR, S—(C)	50
Benzo Fast Bordeaux 6BL—(By)	100
*Benzo Fast Brown 3GL—(By)	882
*Benzo Fast Gray BL—(By)	400
Benzo Fast Heliotrope	320
Benzo Fast Heliotrope 2RL—(By)	
Benzo Fast Heliotrope 4BL—(By)	
Benzo Fast Orange 2RL—(By)	100
†Benzo Red 12B—(By)	50
Brilliant Benzo Violet	640
*Brilliant Benzo Violet B—(By)	
Brilliant Benzo Violet 2R—(By)	
Brilliant Congo Violet R—(A)	200
Brilliant Cotton Blue R Conc.—(Q)	220
*Brilliant Sky Blue 8G Extra—(By)	352
†Chicago Red III—(G)	1,839
*Chloramine Light Violet R Conc.—(S)	500
*Chloramine Violet FFB—(By)	200
Chlorantine Fast Blue 8GL—(I)	110
Chlorantine Fast Gray B—(I)	551
Cotoneral A Extra, AV Extra—(A)	520
Developed Indigo Blue 4GL—(By)	540
Developed Brilliant Green 3G—(Q)	108

Name of Dye and Manufacturer	Quantity (pounds)
Developed Light Yellow 2G—(v)	55
*Developing Pure Blue GL—(A)	100
*Diamine Azo Fast Green G—(C)	50
*Diamine Azo Fast Red 6B—(C)	25
*Diamine Brilliant Scarlet S—(C)	6,500
Diamine Brilliant Violet B—(C)	100
†Diamine Catechine B, G—(C)	400
†Diamine Fast Blue FFB, F3G—(C)	3,700
*Diamine Fast Brown 3G—(C)	50
*Diamine Fast Orange EG, ER—(C)	13,370
*Diamine Fast Red Violet FR—(C)	370
*Diamine Fast Rose B, G—(C)	1,200
*Diamine Fast Rubine FB—(C)	300
*Diamine Fast Yellow 4G—(C)	50
Dianil Fast Violet BL—(M)	100
Diazanil Blue 2R—(M)	1,000
Diazanil Pink B—(M)	100
*Diazo Blue 2R—(L)	2,205
*Diazo Brilliant Green 3G—(By)	300
Diazo Brilliant Orange GR—(By)	100
Diazo Brilliant Scarlet 2BL—(By)	444
Diazo Brown G, 3R, 3RB—(By)	410
*Diazo Fast Violet BL, 3RL—(By)	200
Diazo Geranine B Extra—(By)	147
*Diazo Indigo Blue 4GL Extra—(By)	1,330
Diazo Rubine B—(By)	100
Diazo Sky Blue 3G—(By)	400
Diazophenyl Black V—(G)	2,205
*Diphenyl Fast Gray BC—(G)	220
Direct Fast Orange R—(I)	110
Fast Cotton Gray VL—(A)	800
Formal Fast Black G Conc.—(G)	100
*Ionamine Red GA—(BD)	25
Minaxo Black BBNX—(B)	200
†Minaxo Light Black EB—(B)	998
*Minaxo Light Gray EB—(B)	100
Polyphenyl Blue GS—(G)	4,982
Rosanthrene Orange R—(I)	661
Sky Blue N—(C)	250
Triazogene Orange R Powder—(Gr-E)	100
Universal Bordeaux C—(C)	5
Universal Heliotrope C—(C)	5
Universal Light Blue C—(C)	5
Universal Violet C—(C)	5
Zambesi Black D—(A)	500

The Permutit Company, of New York, has just published in attractive booklet form a well-illustrated reprint of the proceedings of the September 26 meeting of the New York Section of the American Association of Textile Chemists and Colorists. This booklet includes the very instructive lecture given before this section entitled "Water and Its Relation to the Textile Industry," by Howard L. Tiger, of the technical staff of the Permutit Company. Copies of the reprint will be mailed on request.

Technical Notes from Foreign Sources

Retting Flax and Hemp

A new method of retting flax and hemp and other textile materials is described in British Patent No. 208,397. In this method the flax, hemp or fibrous material is retted by boiling it with water in vats for a period of one to two hours. Thereafter the product is inoculated and cooled to a temperature of 24 to 35 deg. Cent. The culture used for the inoculation is a pure culture of Microbe number 6. The bacterial action which is initiated in this fashion is allowed to proceed for a period of 60 to 80 hours.

Microbe number 6 is a special microbe which is isolated from natural flax. It is rod-like (slightly swollen in the middle), its length is from 5 to 8 μ and the diameter is from 1.3 to 1.7 μ, the pores being round or elongated, shaped like a drumstick and occurring at one or both ends of the bacillus. Microbe number 6 is motile during its early stage of growth, but it subsequently becomes immotile. It has a peptonizing action on milk, is stained by Gram's method, by Ziehl's Red and by Gentian Violet; its optimum temperature of development is 28 deg. Cent. and it is resistant to 100 deg. Cent. for a few minutes. When retting is effected by means of Microbe number 6, ferruginous water should be avoided. Sterilization of the contents of the vat is optional.

Sulphur Terpene Impregnating Agent

Non-colloidal, sulphur terpene compounds are obtained in the form of stable aqueous emulsions, which are suitable for the impregnation of fabrics and other textile materials. The process consists in saponifying a homogeneous mixture of the sulphur-terpene and a fatty acid by means of an aqueous solution of an alkali or by dissolving the sulphur-terpene and a fatty acid in a volatile solvent, treating the solution with an aqueous solution of a saponifying agent, and subsequently removing the volatile agent by evaporation.

For example, 100 parts of a non-colloidal sulphur-terpene, which has a melting point of 50 to 70 deg. Cent., and 5 parts of oleic acid are dissolved in 20 parts of benzene, and to this solution are gradually added with agitation a solution containing 100 parts of water, 1 part of oleic acid and 5 parts of ammonia. Benzene is removed from the resulting emulsion by distillation or evaporation.

For further details the reader is referred to British Patent No. 208,382.

Bleaching of Wool and Woolen Yarns

When bisulphites, such as sodium bisulphite, sulphurous acid and the like are employed in the bleaching of sheep's wool, the result is not a pure white product, and hence it is usually customary to blue the product with the aid of a blue dyestuff. This dye is added to the last wash water used in washing the wool after the bleaching operation has been completed. For this purpose Aniline Blue B, Berlin Blue and Methyl Violet are commonly employed.

In the case of Aniline Blue a solution of 40 grams of the dye is made in 4 liters of water with the addition of 20 grams of sulphuric acid. The solution is stirred vigorously and is then filtered. According to the intensity of the whiteness that is required in the finished product, a varying amount of this bluing is employed. After adding the blue it is necessary to keep the wool materials in constant movement.

Of course, Berlin Blue is a pigment that is insoluble in water, but it forms so fine a suspension in water that it can also be used with good results in the bluing of the bleached yarn. In certain cases it is also advisable to use a little alizarine cyanol, water blue, or pure blue in order to improve the color of the product. These dyestuffs are employed in a lukewarm aqueous solution. When the proper care is taken in its use, it is also possible to obtain satisfactory results by using Methyl Violet. In this case 3 to 4 grams of the dyestuff are dissolved in hot water and the filtered solution is added drop by drop to the last wash water. When the bleached goods are treated with this water, it is absolutely necessary that they be kept in constant motion while being treated. After the bluing operation is completed, the excess liquor is centrifuged out of the goods and the latter are then dryed. Spinn und Web. through Deutsche Faerber Zeitung, 1924, 637.

New Developments in the Use of Vat Dyes

The dyeing of goods in variegated colors by means of the vat dyes is a problem which has occupied the attention of color chemists and textile men for a number of years and which has not yet been solved in an entirely satisfactory manner. As far as the dyestuff indigo itself is concerned, a method seems to have been discovered through the preparation of indigosol, which makes it easy to obtain colored effects on the blue background. Indigosol is obtained by the condensation of leucoindigo with chlorsulphonic acid in the absence of water. The product obtained in this manner is a gray powder which is soluble in water and which resists the action of air.

The dyestuff may be developed in two different manners. In the first place, it can be developed in the wet way in the presence of an acid or through steaming. In the former case a weak alkalin solution of indigosol is slop-padded on the textile fabrics by the addition of an oxidizing agent, a nitrate or a chlorate. Then the goods are treated with a solution of dilute sulphuric acid. The oxidizing agent may also be added direct to the sulphuric acid bath and in this case iron chloride is commonly em-

ployed. The slop-padding solution, at times mixed with a little naphthol, is stable for an indefinite period of time.

In printing textile fabrics it has been found very advantageous to employ a nitrite as an oxidizing agent.

In the steaming process sodium chlorate is employed as an oxidizing agent in admixture with sodium carbonate and sodium thiocyanate and a little vanadium chloride. Dextrin is employed as a thickening agent. The amount of the chlorate employed is so small that the vat and azo colors used in the color discharge process are not injured in any way by the chemical. In order to prevent the development of the dyestuff it is necessary to print a reducing agent or an alkali on the spots where the colored effects are to be produced. The alkali neutralizes the acid. Consequently each discharge which can be used with Aniline Black printing can also be used in the case of indigosol.

In the case of white discharging the following substances may be employed: Caustic alkalis, acetates, carbonates, sulphites, thiosulphates and formaldehyde-hydrosulphite. Pigment colors are employed in admixture with zinc oxide and albumen, basic dyestuffs with resorcin and formaldehyde as thickening agents.

Particularly fine effects can be obtained with katanol. Brilliant red, orange and yellow discharges can be obtained with the fast colors under consideration with the addition of 10 per cent of sodium acetate or sodium thiosulphate. The most important color discharges are, however, obtained with the aid of the vat dyestuffs, as the colored discharge effects produced in this manner are as fast as the background on which they are produced.

However, when using the vat dyestuffs to effect color discharges, it is necessary to avoid using caustic alkalis, as when such are used a brighter edge is easily engendered, which is detrimental. After steaming, the goods are oxidized with the aid of bichromates and then soaped. The steaming should last about 5 minutes at a temperature of approximately 100 deg. Cent. In this way it is possible to obtain many different colored discharge effects with little trouble. It must not, however, be denied that the process is somewhat more expensive than the other methods, and, to be sure, than the simple vat dyeing with indigo. However, the extra expense involved is more than compensated for by the good results obtained with it. Der Textilcheimker und Colorist, 1924, 144.

Luster Produced in Cotton by Mercerization

Quantitative measurements of the reflected and scattered light from mercerized and unmercerized cotton fibers, yarns and fabrics, and from glass fibers were made by means of a modified Joly photometer. In nearly all instances the luster of glass fibers resembled that of mercerized cotton more closely than that of unmercerized cotton. By means of an arbitrary but strictly comparative method, the relative luster of glass and of mercerized and unmercerized cotton fibers was shown to be 3.0, 2.7 and 0.94. Although mercerized cotton fibers show opalescence due to internal reflection, their luster can be almost completely accounted for by a single surface reflection.

Light reflected from a mercerized cotton fiber is concentrated within a small angle, but it is spread out, due to scattering, in a wider angle in the case of unmercerized cotton. The enhanced luster of sateen, with floating threads, is related to the intensification of luster which is produced when a number of mercerized fibers are placed parallel to each other. The presence of points of high light increases the beauty of a lustrous fabric, for example, a Schreinered fabric, and a well mercerized fabric shows such a distribution of light. The total amount of light reflected from mercerized fabric is usually less than that from the more uniformly lighted surface of unmercerized fabric, since mercerization can increase the transparency of a fabric by 30 per cent. The original of this abstract is found in the Transactions of the Faraday Society, June, 1924.

Weighting of Silk

German Patent No. 392,279 is concerned with a process of weighting silken fabrics which have already been weighted with mineral matter. In this process logwood or haematoxylin is employed as the additional loading material. The process is carried out by immersing the weighted silk in a soap bath which contains logwood or haematoxylin and an alkali hydroxide or carbonate. The addition of the latter converts the dyestuff into its salt and results in a saving of soap.

Hydrosulphite Discharges on Azo Dyes

Fabrics are dyed with or without subsequent development by the usual methods when direct dyestuffs are employed in the process. These fabrics are then padded with a 5 per cent solution of tannic acid; then they are dried in a hot flue, treated with tartar emetic, washed, dried, printed with a discharge paste which contains from 5 to 30 grams of a basic dyestuff, 40 grams of glycerine, 100 grams of alcohol, 30 grams of water, 600 grams of gum arabic thickening and 200 grams of a mixture containing equal parts of the hydrosulphite NF concentrated, and gum arabic thickening. They are then passed through an atmosphere saturated with moisture in a Mather-Platt, allowed to oxidize in the air till the following day, then oxidized during two or three passages through a Mather-Platt, washed in slightly warm water, soaped at 50 deg. Cent. for 10 to 15 minutes, and then dried. Suitable amounts of dyestuff for the above discharge paste are 30 grams of Rhodamine 6G Extra Conc. and 5 grams of Auramine G (for red), ten grams of Rhodamine 6G Extra Conc. and 5 grams of Printing Blue S (for violet), 25 grams of Acridine Yellow for orange, etc. It is also reported that good white discharges cannot be obtained but that a particularly good red discharge is obtainable by this process. (See Bulletin Societe Mulhouse, 89, 780-1.)

Dyestuff Tables

A List of the Principal American-Made Colors with Their Properties and Fastness Characteristics

[NOTE: The publishers of The REPORTER have secured more or less complete data in regard to many of the dyestuffs which are at the present time being manufactured in the United States. As the following material has been brought together from various sources, they realize that errors are quite likely to appear, and it is earnestly requested that any readers who find errors or who are able to give additional information will communicate with the publishers in order that this material may be made as correct, complete and up to date as possible. These tables will appear serially until all colors upon which we have data shall have been covered. The publication of this data was begun in the issue of March 10, 1924.]

CORRECTION

In giving the properties of Brilliant Sulphon Red B, Schultz No. 182, it was stated that on top-chroming this color turned a reddish brown. Subsequent experiment has contradicted this statement. It was found that top-chroming caused the shade to go considerably duller, but that it did not go brown with a normal amount of chrome.

SULPHONCYANINE

(Schultz No. 257)

COMPOSITION: Disazo.

SPECIALLY SUITABLE FOR: Wool.

USUAL METHOD OF DYEING: Neutral with acetate of ammonia; a little chrome in the bath helps the shade. Hard boiling dulls the shade.

SHADE: Reddish navy blue.

SHADE BY GASLIGHT: Redder.

SOLUBILITY: Good; should not be boiled when dissolving.

LEVEL: Requires care in raising to the boil.

EXHAUSTS: Very quickly as the boil is reached.

PENETRATION: Fair.

FASTNESS TO:

Acid: Fast.
Alkali: Fast.
Carbonizing: Fast.
Cross-Dyeing: Moderate; will not stand cross-dyeing.
Fulling: Fast.
Ironing: Fast.
Light: Fast enough for men's wear; similar to Wool Fast Blue BL.
Potting: Not fast; bleeds badly.
Rubbing: Fast.
Scouring: Not fast against hot soap.
Steaming: The color will not stand steaming.
Sulphur: The color will not stand stoving.
Washing: Fast.

MACHINE DYEING: Suitable; use chrome in bath when dyeing in metal machines.

OTHER PROPERTIES: Largely used in manufacture of union colors and for dyeing navies on knitting yarns.

DYED BY OTHER METHODS: Dyes top chrome, chrome bottom or chromate. Chrome has no effect on the fastness when used in the bath, but is used to neutralize the effect of the sulphur in the wool, which would otherwise reduce the dye and make the shade dull.

ON UNIONS: Cotton-wool unions: Dyed acid, the cotton is slightly stained; dyed neutral, the wool is heavier than the cotton.

ON OTHER MATERIALS: Gloria: Not suitable. Silk: Dyed in a soap bath with acetic acid; fast to washing, water, acids, alkalies, rubbing and hot pressing.

PRINTING: No interest.

DISCHARGING: Sulphoxalates discharge the color yellow.

COMPETING PRODUCTS: Made in the United States by Amalgamated Dyestuff & Chemical Works (Selling Agents, John Campbell & Co.); E. I. du Pont de Nemours & Co.; Garfield Aniline Works (Selling Agents, U. S. Color & Chemical Company); Grasselli Dyestuff Corporation; National Aniline & Chemical Company; New England Aniline Works (Selling Agents, U. S. Color & Chemical Company).

VICTORIA BLACK

(Schultz No. 262)

COMPOSITION: Disazo.

SPECIALLY SUITABLE FOR: Wool.

USUAL METHOD OF DYEING: Glauber salt and acetic acid.

SHADE: Considerably redder than S-272.

SHADE BY GASLIGHT: Goes redder.

SOLUBILITY: Good.

LEVEL: Does not dye level.

EXHAUSTS: Very quickly.

FASTNESS TO:

Acid: Fast except to concentrated muriatic, which turns it red.
Alkali: Fast.
Fulling: Good against white wool; white cotton is stained.
Light: Fast.
Perspiration: Fast.
Rubbing: Fast.
Scouring: Good against white wool; white cotton is stained.
Sulphur: Fast.
In order to match the shade of S-272, small additions of green and yellow are necessary.

OTHER PROPERTIES: This color exhausts very quickly. In consequence of this, uneven shades are apt to result and the pieces may not be well penetrated. The shade is very red.

DYED BY OTHER METHODS: After-treated with bichrome or fluoride of chrome, the shade is faster to fulling.

ON UNIONS: Cotton-wool unions: The cotton is dyed slightly red. Cotton-silk unions: Both fibers nearly the same shade.

ON OTHER MATERIALS: Silk: Not fast to water or soap on this fiber.

PRINTING: Not adapted for printing.

COMPETING PRODUCTS: Made in the United States by the Chemical Company of America as Victoria Black.

SULPHONCYANINE BLACK

(Schultz No. 265)

COMPOSITION: Disazo.

SPECIALLY SUITABLE FOR: Wool pieces and knitting yarns.

USUAL METHOD OF DYEING: Neutral with acetate of ammonia. Chrome in the bath helps the shade. More sensitive to hard boiling than S-257.

SHADE: Bluish black; brighter than Nerol.

SHADE BY GASLIGHT: Duller.

SOLUBILITY: Good (do not boil when dissolving the color).

LEVEL: Dyes level as a black, but is very sensitive to acid.

EXHAUSTS: Not clear.

FASTNESS TO:

Acid: Moderate.
Alkali: Fast.
Cross-Dyeing: Color will not stand cross-dyeing.
Fulling: Fast when top-chromed.
Ironing: Fast.
Light: Dyed direct, good; on chrome, faster than Alizarine Blue Black B.
Perspiration: Fast.
Potting: Not fast; bleeds.
Rubbing: Crocks slightly.
Steaming: The color will not stand steaming.
Sulphur: The color will not stand stoving.
Washing: Fast.
Water: Stands Markischer test. Also fast to salt water.
Finishng: Not as good as Nerol BB.

SENSITIVE TO METALS, LIME: Not as sensitive to metals if chrome is used in the bath. Otherwise the color is weaker and redder in presence of iron.

MACHINE DYEING: Suitable.

OTHER PROPERTIES: The color is more easily decomposed by boiling than S-257.

DYED BY OTHER METHODS: Dyes wool well in neutral bath. Dyed chromate, good. Knitting yarns are dyed level and very fast to washing.

ON UNIONS: Wool-silk unions: The silk is lighter than the wool. Cotton-wool unions: Dyed acid, the cotton is stained; dyed neutral, the cotton is stained very deeply.

ON OTHER MATERIALS: Silk: Suitable; fairly fast to water and washing.

PRINTING: Not adapted for discharge printing. Suitable for direct printing on wool and Gloria. The fastness to water of the printed shade is satisfactory.

DISCHARGING: The dyed shade discharges yellow with sulphoxalates, tin crystals or zinc dust.

COMPETING PRODUCTS: Made in the United States by E. I. du Pont de Nemours & Co.; Grasselli Dyestuff Corporation; National Aniline & Chemical Company; New England Aniline Works (Selling Agents, U. S. Color & Chemical Company).

NAPHTHYLAMINE BLACK D

(Schultz No. 266)

COMPOSITION: Disazo.

SPECIALLY SUITABLE FOR: Wool and Gloria.

USUAL METHOD OF DYEING: Neutral with Glauber salt or slightly acid bath. The shade goes flat with excess of acid.

SHADE: Violet black.

SHADE BY GASLIGHT: Redder.

SOLUBILITY: Good.

LEVEL: Dyes level in blacks.

EXHAUSTS: Well with acid.

FASTNESS TO:

Acid: Fast.
Alkali: Fast.
Carbonizing: Fast.
Fulling: Bleeds into whites; excels S-272.
Light: Stands fourteen days' exposure; inferior to S-272.
Rubbing: Crocks slightly.
Steaming: Shade goes lighter; will stand a light steaming.
Sulphur: Shade goes redder.
Washing: Fast; better than S-272.

DYED BY OTHER METHODS: Dyes wool well in a neutral bath and is used in union dyeing.

ON OTHER MATERIALS: Silk: Dyed in a bath of boiled-off liquor broken with sulphuric acid. Fairly fast to water and washing.

COMPETING PRODUCTS: Made in the United States by American Aniline Products, Inc.; E. I. du Pont de Nemours & Co.; Grasselli Dyestuff Corporation; Amalgamated Dyestuff & Chemical Works (Selling Agents, John Campbell & Co.)

NAPHTHOL BLACK

(Schultz No. 269)

COMPOSITION: Disazo.

SPECIALLY SUITABLE FOR: Wool pieces.

USUAL METHOD OF DYEING: Glauber salt and sulphuric acid.

SHADE: Bluish black.

SHADE BY GASLIGHT: No change.

SOLUBILITY: Good.

LEVEL: Dyes level in blacks.

EXHAUSTS: Well.

FASTNESS TO:
Acid: Fast.
Alkali: Fast.
Carbonizing: Fast.
Fulling: Whites are stained.
Light: Not equal to S-272.
Potting: Not fast.
Steaming: Fast.
Sulphur: Fast.
Washing: Whites are stained.

ON UNIONS: Cotton-effect threads are left white in an acid bath. Silk-effect threads are slightly stained.

PRINTING: Suitable for direct printing.

COMPETING PRODUCTS: Made in the United States by American Aniline Products, Inc.

PONSOL GOLDEN ORANGE G

E. I. du Pont de Nemours & Co. have recently placed on the market products similar to Indanthrene Golden Orange G, in both the powder and paste forms, under the names of Ponsol Golden Orange G Double Powder and Ponsol Golden Orange G Double Paste.

The properties of the Ponsol Golden Orange G types are identical with Indanthrene Golden Orange G. They are dyed in the usual way in an alkaline hydrosulphite bath. These colors can even be dyed cold and are also suitable for machine dyeing.

They are particularly important for obtaining a wide range of mode shades, tans, browns, etc. They are said to possess excellent fastness to light, washing, chlorine, and can therefore be used for all classes of fabrics where extreme fastness is required.

As these products stand chlorine very well, they can be used for dyeing yarns to be woven into gray goods, which must subsequently be bleached in the piece. They can be dyed on artificial silk even in the most delicate shades. On pure silk by special methods they yield dyeings of excellent fastness to light, water, washing, perspiration, boiling soap and peroxide.

The introduction of these products is a notable achievement of vat color manufacture.

DATA ON NEWPORT COLORS

As inserts for the binder recently mailed to the trade, the Newport Chemical Works, Inc., have issued to date over fifty sheets showing single Newport colors on sample swatch bows and describing the application of each color, giving the formula used in making up the dye bath, and enumerating the notable properties and fastness properties of each color.

Under the heading, "Notable Properties," helpful information is given regarding, for instance, the suitability of the color for unions, for silk and for artificial silk, the improvement of its fastness by aftertreatment, its degree of discharge and other useful data. Under "Fastness Properties" the color's fastness to light, weather, washing, chemicking, rubbing, acids, alkalis, hot pressing, cross dyeing and metals is accurately recorded. It is not usually sufficiently appreciated that a list of such fastness properties is the result of long experimentation with each color.

These sheets also list the colors with which each single color may be combined in application. These sheets will be sent on request to those interested. A complete file of them should prove of unlimited practical value to users of the colors described, and would constitute a file of reliable directions for obtaining maximum results with each Newport color.

NOIL DIRECT BROWN B

Noil Direct Brown B, recently announced by the Noil Chemical & Colors Works, Inc., is a brown for cotton, plush and wool, described as level dyeing and as possessing excellent fastness to acid and good fastness to light and washing. If after-treated with bluestone and chrome when used on cotton its fastness is said to be greatly strengthened. Furthermore, it lends itself to discharge printing with hydrosulphite, producing clearer whites. For this purpose it is claimed to excel pre-war prototypes.

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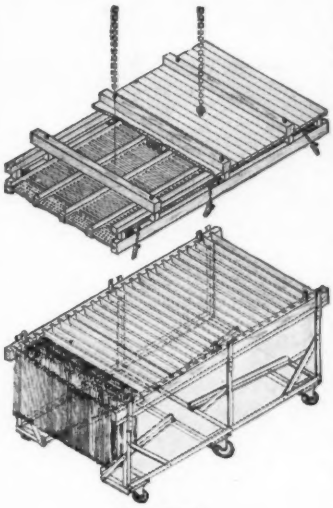

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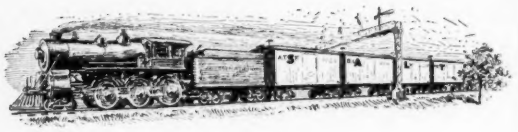

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Chrome Acetate

THIS compound is a mordant adapted for calico printing and also is extensively used for dyeing of Mineral Khaki on cotton.

Nainsook Softener

THIS preparation is especially adapted for pure finishes of the Nainsook checks for summer wear, and any such kindred finishes, where a soft, silky feel is required.

Aquasol

A PRODUCT especially useful in dyehouses where level dyeing and penetration of the dyestuff and lustre are desired.

Softener T

A COMPOUND perfectly adapted for cotton warp sizing. The thorough penetration obtained with this size on the warps reduces to a minimum the flaking or dusting off.

Kier Soap RZD

A COMPOUND used chiefly as an assistant in Kier boiling for quick wetting out of various vegetable fibres, also an assistant in bleaching and in mercerizing.

Softener 8 A

A COMPOUND particularly well adapted for the finishing of Ginghams and similar fabrics.

TRADE MARK